# SOUTHERN INTERTIE PROJECT FINAL ENVIRONMENTAL IMPACT STATEMENT

# **VOLUME II – MITIGATION PLAN**

Rural Utilities Service, U.S. Department of Agriculture

In cooperation with

U.S. Fish and Wildlife Service, Department of the Interior U.S. Army Corps of Engineers, Department of Defense

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# **MITIGATION PLAN**

# 1.0 INTRODUCTION

Mitigation planning has been an integral component of the Project from the initial Macro Corridor Study beginning in 1995 through the preparation of the DEIS, as shown on Figure 1. Chapter 2 and Appendix B of the DEIS describe the project description, which incorporates both standard and selective mitigation measures listed in the DEIS (Appendix D).

During the preparation of the FEIS, interested federal, state, and local agencies reviewed the locations and effectiveness of selective mitigation measures along alternative routes. Meetings occurred in March 2002 in Anchorage and Soldotna with the EPA, ADF&G, KPB, Kenai River Center, Alaska Department of Governmental Coordination, and the Municipality of Anchorage Planning and Park and Recreation Departments. The resulting mitigation plan provides specific locations of the mitigation measures applied in the DEIS and summarizes the effectiveness of these measures in avoiding or reducing environmental impacts.

Results of the mitigation plan provide the site-specific mitigation commitments that are required in the Record of Decision (ROD). This will ensure that decisions are made assuming all practicable means to avoid or reduce impacts have been adopted and if not, why not, as required in 40 CFR 15 (5.3(e)). This mitigation plan will also ensure that the mitigation measures presented in the DEIS and prescribed in this plan are incorporated into the ROD and adhered to during the implementation of the Project.

#### 2.0 MITIGATION PLAN

The mitigation plan has been divided into five sections that include the following:

- Section 2.1 Standard Practice Project Mitigation, describes measures to protect the environment as standard practice for the entire Project.
- Section 2.2 Selective Mitigation Measures, describes and depicts each selective mitigation measure proposed for the Project.
- Section 2.3 Design and Construction Mitigation, identifies the proposed structure types in relationship to existing utilities and specific design and construction-related mitigation measures for the Project.
- Section 2.4 Selective Mitigation Measure Locations, provides specific locations for the selective mitigation measures.

 Section 2.5 – Impact Mitigation Summary, documents the combined mitigation measures applied to the environmental receptors and summarizes the overall effectiveness of the mitigation.

#### 2.1 MITIGATION AND STANDARD PRACTICE MEASURES

Mitigation typically involves one or more of the following:

- avoiding the impact by not taking a certain action or part of an action
- *minimizing* impacts by limiting the degree of magnitude of the action and its implementation
- rectifying impacts by repairing, rehabilitating, or restoring the affected environment
- *reducing* the impact
- compensating for the impact by replacing or providing substitute resources or environments

As part of the Project description, certain measures to protect the environment are considered standard practice for the entire Project as described in the DEIS (Appendix D, Table D-1). These measures are referred to as "standard practice project mitigation" and are summarized in Table 1. The impact levels initially assigned (initial impact levels) to the Project assume that these standard practice project mitigation measures are implemented.

#### 2.2 SELECTIVE MITIGATION MEASURES

Where warranted on a case-by-case basis, mitigation beyond these standard measures was recommended to further reduce adverse impacts to an acceptable or lesser level. These are called selective mitigation measures, and they include those measures or techniques to which the Project proponents commit on a case-by-case, or selective, basis after initial impacts are identified and assessed. For purposes of evaluating the alternative routes at the environmental analysis stage of a project, selective mitigation measures provide a planning tool for minimizing potential adverse impacts.

Illustrations of the 20 selective mitigation measures described in the DEIS (Appendix D, Table D-2) are presented on Figure 2 of the Mitigation Plan. This figure provides a description of each of the selective mitigation measures developed for the Project and a sketch typical of the application of each measure.

# Southern Intertie Project Siting Study and Mitigation Process

	Task	Results / Benefits
Regional Studies	Corridor Selection (1995-1996) used existing linear facilities to identify corridors transmission lines roads pipelines	avoided new overland / cross country routes
	Draft EIS (1996-2001)  Facility Siting     established routes     transition sites     planned corridors     rights-of-way	avoided local area impacts North Kenai Spur Road planned transportation / utility corridor consultation / public involvement
NEPA	Concept Design Level eliminated Quartz Creek Route project description / general mitigation pole/tower type: single pole, shorten poles winter construction / timing undergrounding	avoid or reduce site-specific impacts bird collision tree trimming sensitive habitat / wetlands tourism conflicts airports parks
	Impact Assessment / Selective Mitigation	issues remaining: KNWR related impacts on Enstar Route bird collisions and visual impacts on Tesoro Route
	Final EIS (Summer 2002) assessment refinement mitigation refinement / effectiveness	minimize effects to site-specific impacts
	Record of Decision (Fall 2002)	stipulations for construction, operation, and maintenance
Permitting	Permitting stipulations	stipulations for construction, operation, and maintenance

July 2002 Figure 1

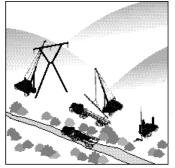
	TABLE 1 STANDARD PRACTICE PROJECT MITIGATION MEASURES
	INCLUDED IN THE PROJECT DESCRIPTION
1	All construction vehicle movement outside the right-of-way will be restricted to predesignated access, contractor acquired access, or public roads.
2	The areal limits of construction activities will be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate survey or construction activity limits.
3	In construction areas where recontouring is not required, vegetation would be left in place wherever possible and original contour would be maintained to avoid excessive root damage and allow for resprouting.
4	In construction areas (e.g., marshaling yards, tower sites, spur roads from existing access roads) where ground disturbance is substantial or where recontouring is required, surface restoration would occur as required by the landowner or land-managing agency. The method of restoration would normally consist of returning disturbed areas back to their natural contour and reseeding (if required).
5	Towers and/or conductors would be marked with high-visibility devices where required by governmental agencies (FAA).
6	Prior to construction, all supervisory construction personnel would be instructed on the protection of cultural and ecological resources. To assist in this effort, the construction contract would address (a) federal and state laws regarding antiquities and plants and wildlife, including collection and removal; and (b) the importance of these resources and the purpose and necessity of protecting them.
7	The IPG would continue to consider cultural resources during post-EIS phases of project implementation in accordance with the programmatic agreement that would be developed in conjunction with preparation of the environmental impact statement. This would involve intensive surveys to inventory and evaluate cultural resources within the selected corridor and any appurtenant impact zones beyond the corridor, such as access roads and construction equipment yards. In consultation with appropriate land-managing agencies and state historic preservation officers, specific mitigation measures would be developed and implemented to mitigate any identified adverse impacts. These may include project modifications to avoid adverse impacts, monitoring of construction activities, and data recovery studies.
8	The IPG would respond to complaints of line-generated radio or television interference by investigating the complaints and implementing appropriate mitigation measures. The transmission line would be patrolled by air on a regular basis so that damaged insulators or other line materials that could cause interference are repaired or replaced.
9	The IPG would apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing a right-of-way, to meet the appropriate codes.
10	Stream crossings will be as near as possible at right angles to streams. Bridges or culverts would be installed where necessary. All construction and maintenance activities shall be conducted in a manner that would minimize disturbance to vegetation, drainage channels, and intermittent or perennial stream banks. Towers will be sited with a minimum distance of 200 feet from streams.

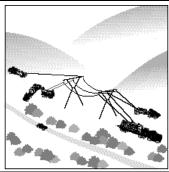
	TABLE 1 STANDARD PRACTICE PROJECT MITIGATION MEASURES				
	INCLUDED IN THE PROJECT DESCRIPTION				
11	All requirements of those entities having jurisdiction over air quality matters would be adhered to and any necessary permits for construction activities would be obtained.				
12	Fences and gates would be repaired or replaced to their original predisturbed condition as required by the landowner or the land-managing agency if they are damaged or destroyed by construction activities. Temporary gates would be installed only with the permission of the landowner or the land-managing agency; and would be restored to its original predisturbed condition following construction.				
13	During operation and maintenance of the transmission line, the right-of-way would be maintained free of non-biodegradable debris resulting from IPG activities.				
14	Hazardous materials shall not be drained onto the ground or into streams or drainage areas.  Totally enclosed containment shall be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials shall be removed to a disposal facility authorized to accept such materials.				
15	No construction camps will be established along the right-of-way. Construction crews are expected to be able to find housing within communities in the study area. Construction crews will be transported to work sites daily.				
16	Pre-construction surveys for plants and wildlife species designated as sensitive or of concern will be conducted in areas of known occurrence or habitat as stipulated by the land-managing agency during the development of the Construction, Operation, and Maintenance Plan once the transmission line centerline, access roads, and tower sites have been located and staked in the field.				
17	Care will be taken to reduce the possibility of bear-human interactions during construction.  Construction camps will not be established along the right-of-way and any waste generated during construction will be properly stored and disposed of, so that bears are not attracted to construction areas. Bear training will be provided to personnel.				
18	Engineering design will include safeguards to prevent or reduce the possibility of fluid leaks due to damage to the cable from natural hazards in submarine and terrestrial environments.				
19	Trenching of submarine cables in coastal marsh lands will be backfilled and reclaimed.				
	To the extent practicable, construction will be completed during winter months to avoid damage to areas of sensitivity.				

#### **DESCRIPTION OF SELECTIVE MITIGATION MEASURES**

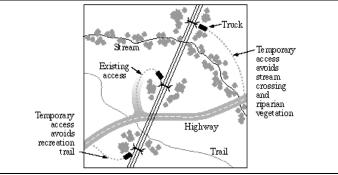
#### MITIGATION EXAMPLES

In areas where soils and vegetation are particularly sensitive to disturbance, existing access roads/trails will not be widened or otherwise upgraded for construction and maintenance, except in areas where repairs are necessary to make existing roads/trails passable.

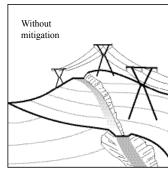




To avoid disturbance to sensitive features (e.g., streams, recreation trails), access roads will not be constructed in those areas. Rather, construction and maintenance traffic will use existing roads or cross-country access routes (including the rightof-way). To minimize ground disturbance, construction traffic routes must be clearly marked with temporary markers such as easily visible flagging. The construction routes or other means of avoidance must be approved in advance of use.

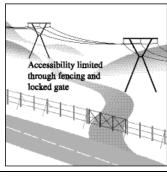


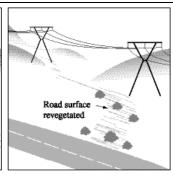
To minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, the alignment of any new access roads or crosscountry routes will follow the landform contours in designated areas where practicable, providing that such alignment does not impact resource values additionally.



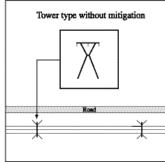


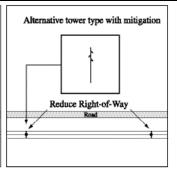
To limit new or improved accessibility into the area, all access that is undesired or not required for maintenance will be closed using the most effective and least environmentally damaging methods appropriate to that area and developed with concurrence of the landowner or land manager. Low growing, native shrubby vegetation such as willow will be planted within the right-of-way.





To minimize ground disturbance, operational conflicts, and/or visual contrast, the tower design will be modified or an alternative tower type will be used.

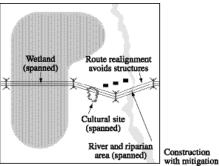




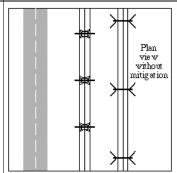
# DESCRIPTION OF SELECTIVE MITIGATION MEASURES

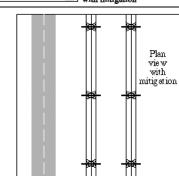
#### MITIGATION EXAMPLES

To minimize the amount of sensitive features disturbed in designated areas, structures and access roads will be placed so as to avoid sensitive features such as, but not limited to, riparian areas, watercourses, residential uses, and cultural sites, and/or to allow conductors to clearly span the features, within limits of standard tower design. Avoidance may be accomplished by spanning sensitive features, shifting the alignment to the opposite side of an existing line, or realigning the route.

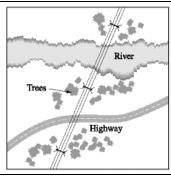


7 To reduce visual contrast and/or potential operational conflicts, standard tower design will be modified to correspond with spacing of existing transmission line structures where feasible and within limits of standard tower design. The normal span will be modified to correspond with existing towers, but not necessarily at every location.



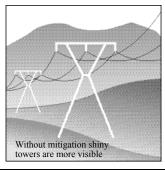


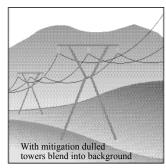
**8** To reduce visual impacts, potential impacts on recreation values and safety at highways and trail crossings, towers are to be placed at the maximum feasible distance from the crossing within limits of standard tower design.



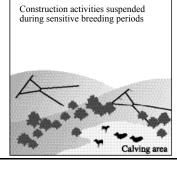
Towers placed maximum distance from river and highway crossings

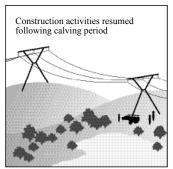
9 "Dulled" metal or corten finish on towers will be used to reduce visual impacts.





With the exception of emergency repair situations, the construction, restoration, maintenance, and termination activities in designated areas (e.g., buffer zones) will be modified or curtailed during sensitive periods (e.g., nesting and breeding periods) for sensitive animal species. Sensitive periods and areas of concern would be approved in advance of construction or maintenance by the authorized officer. Winter construction during frozen conditions would be an alternative for avoiding sensitive periods or areas of wildlife concern, soft and wet ground conditions, and stream crossings.

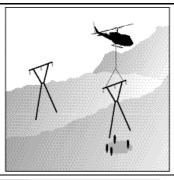




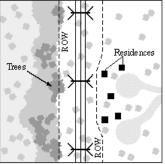
# DESCRIPTION OF SELECTIVE MITIGATION MEASURES

#### MITIGATION EXAMPLES

**11** Helicopter placement of towers during construction and helicopter patrol and maintenance may be used to reduce surface impacts in highly sensitive locations.

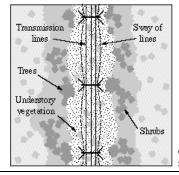


12 To reduce visual contrast or avoid features (such as, but not limited to, land uses, jurisdiction, biological or cultural resources sites), clearing of the right-of-way will be minimized or in limited instances the right-of-way may be reduced (within the limits of conductor-clearance requirements and standard tower design).



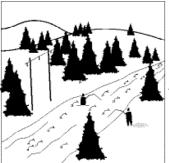
Right-of-way reduced to avoid residences and reduce vegetation clearing

To minimize disturbance to vegetation resources and reduce visual contrast, clearing of trees in and adjacent to the right-of-way will be minimized to the extent practicable to satisfy conductor-clearance requirements (National Electric Safety Code). Trees and other vegetation will be removed selectively (e.g., edge feathering) to blend the edge of the right-of-way into adjacent vegetation patterns, as practicable and appropriate.



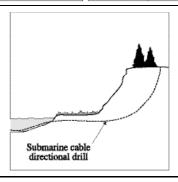
Clearing of trees minimized

14 Construction near anadromous fish streams will be timed and carried out in a manner that minimizes any potential impacts on subsistence, sport, and commercial fishing efforts, including avoidance of construction along anadromous streams during the peak salmon spawning periods.





15 To avoid disturbance to coastal bluffs and marsh lands, such as in the Anchorage Coastal Wildlife Refuge, submarine cables will be installed with horizontal directional drilling. In the case of marsh lands, directional drilling would extend out beyond the lower extent of salt marsh vegetation.



# **DESCRIPTION OF SELECTIVE** MITIGATION MEASURES

# MITIGATION EXAMPLES

re	Fransmission line will be placed underground, where equired, in parks and in the flight path of airstrips and airports.	Underground line
tr e	To minimize visual impacts, submarine to overhead ransition facilities will be placed within a small enclosed building in context with the surrounding architecture.	Transition facility
<b>18</b> C	Cable system will be designed to limit fluid loss.	The submarine cable insulating oil system will be "pressurized" instead of "gravity fed", which allows for a lower total amount of insulating oil in the system.
	Line diverters, spheres, or marking of lines will make hem more visible to birds.	
С	Burying small diameter fiber optic wires normally carried above conductors may be considered in sensitive areas.	Buried fiberoptic wire

## 2.3 DESIGN AND CONSTRUCTION MITIGATION

# 2.3.1 **Proposed Structure Types and Existing Utilities**

Figures 3a, 3b, and 3c show the location of the existing utilities that are paralleled or replaced by the proposed alternatives. These figures also illustrate where tower designs have been modified or an alternative tower type will be used for mitigation (see Measure 5 on Figure 2), and where transmission lines will be undergrounded to avoid sensitive areas (see Measure 16 on Figure 2).

These figures also illustrate where mitigation for avian collision would be applied (see Measures 19 and 20, Figure 2). A detailed discussion on the potential for avian collision and the effectiveness of mitigation is also provided in Chapter 2, Section 2.2.8 (pages 2-32 to 2-34) in Volume I of the FEIS.

## 2.3.2 Construction Season

Construction timing has been assigned to specific seasons to reduce environmental impacts along alternative routes, as illustrated on Figures 4a, 4b, and 4c (follows Figures 3a through 3c). Winter construction during frozen seasons has been proposed to avoid sensitive periods or areas of wildlife concerns, soft or wet ground conditions, and stream crossings. These figures also illustrate the avoidance of construction across the Turnagain Arm during beluga whale calving season and the migratory bird nesting season (Measure 10 on Figure 2).

#### 2.3.3 Construction Methods and Access

Figures 5a, 5b, and 5c (follows Figures 4a through 4c) depict the methods by which each alternative would be constructed and construction access. The method of construction has been determined based on response to environmental conditions, timing of construction, and available access. As identified on these figures, special equipment including the use of swamp buggies and low ground pressure vehicles have been prescribed in areas of limited access and sensitive ground conditions (Measures 2 and 3, Figure 2). In addition, these figures illustrate where horizontal directional drilling would occur in order to avoid impacts to bluffs and coastal zone salt marsh areas (see Measure 15, Figure 2).

NOTE: When reviewing Figures 3 through 5 the designation of mileposts corresponds to the links as identified on the General Reference Map (located in the map pocket on the back cover of the FEIS, Volume 1).

## 2.4 SELECTIVE MITIGATION MEASURE LOCATIONS

Bar charts (Figures 6a through 6n) have been prepared to illustrate the specific milepost locations for each of the 20 selective mitigation measures described on Figure 2, as they have been applied to the Tesoro and Enstar alternatives (follows Figures 5a through 5c).

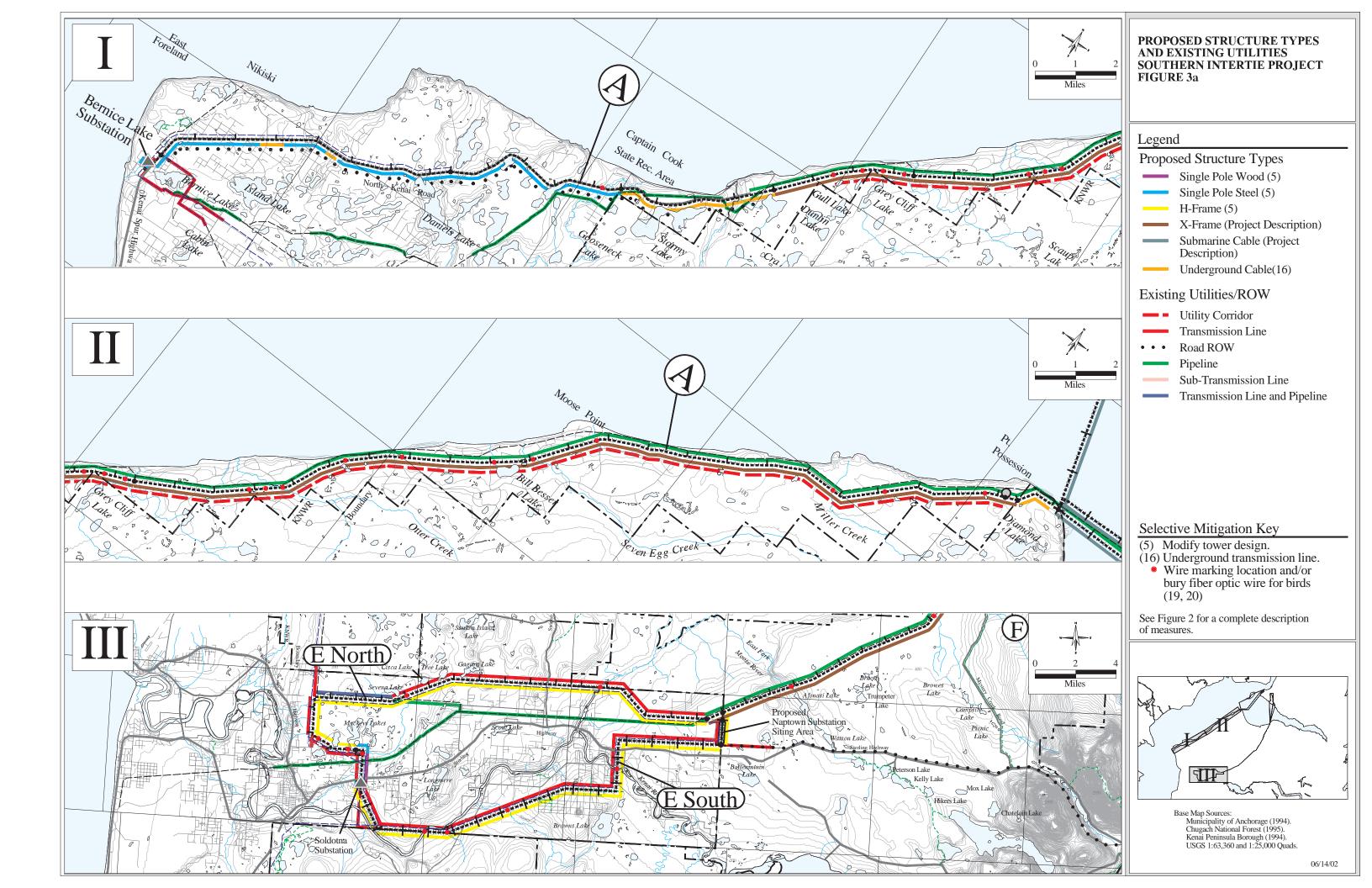
Included in each chart is (1) a milepost and link reference; (2) a general description of the area(s) crossed by each alternative including key environmental features (i.e., stream crossings and airstrips); (3) the conditions within which facilities have been sited (i.e., existing or planned utility corridor, or parallel to existing utilities or roads); (4) the specific location of each of the 20 selective mitigation measures (as applicable); and (5) the effectiveness of these measures including significant environmental impacts.

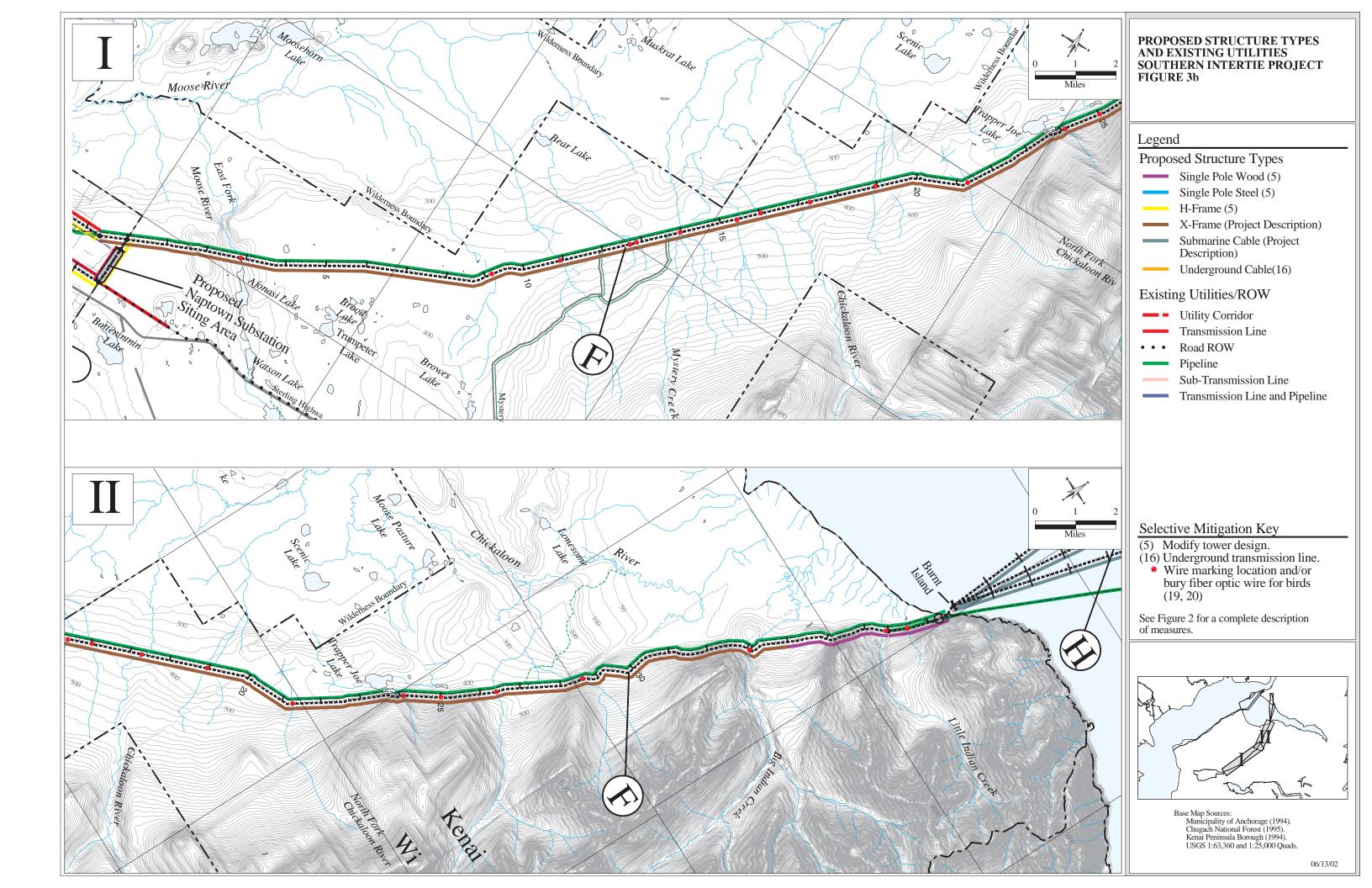
A map of the alternatives studied in detail follows these charts for ease of reference to each route option (including submarine cable crossings of the Turnagain Arm). For additional reference to specific links see the General Reference Map (located in the map pocket on the back cover of the FEIS, Volume I).

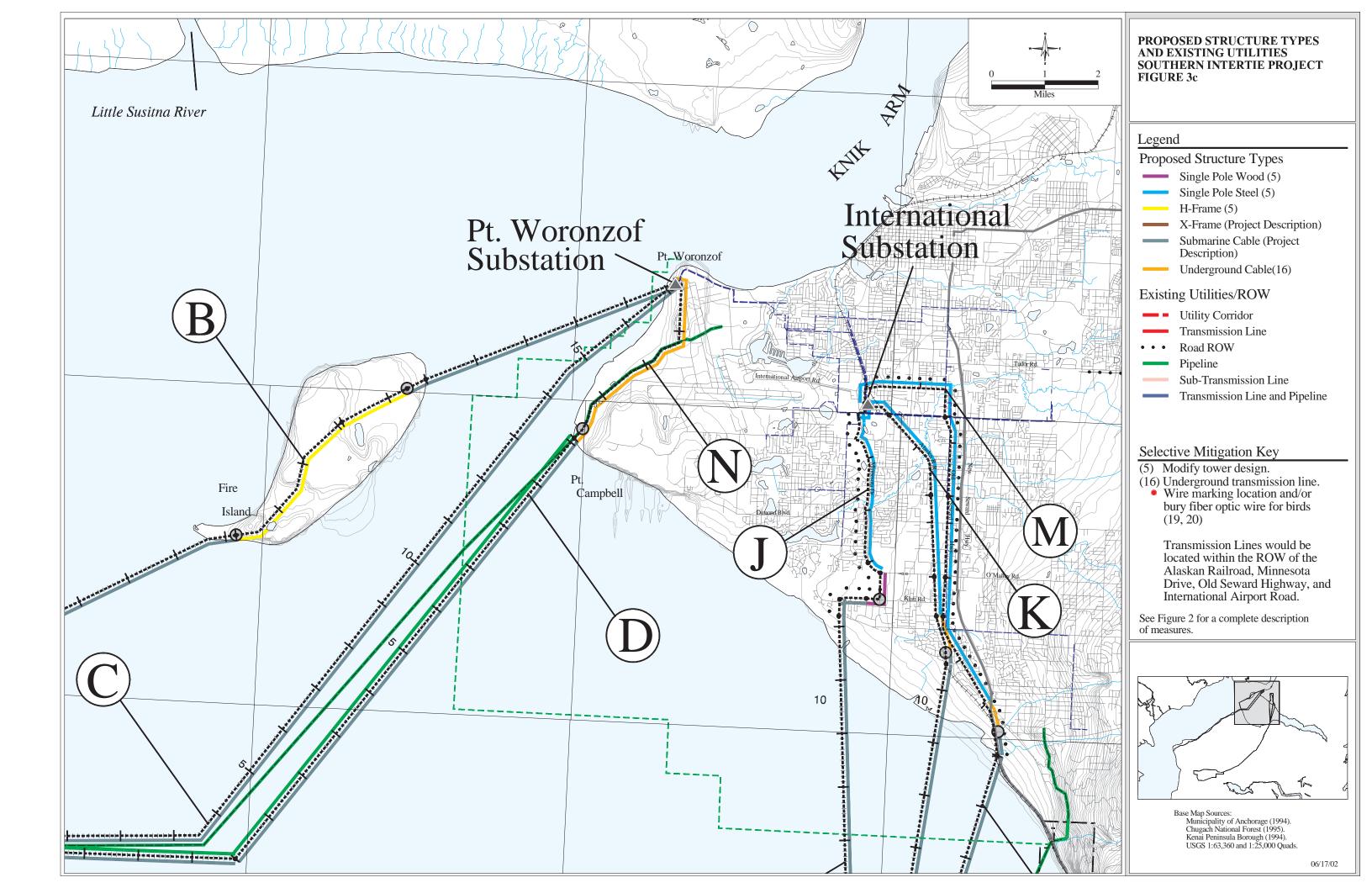
#### 2.5 IMPACT MITIGATION SUMMARY

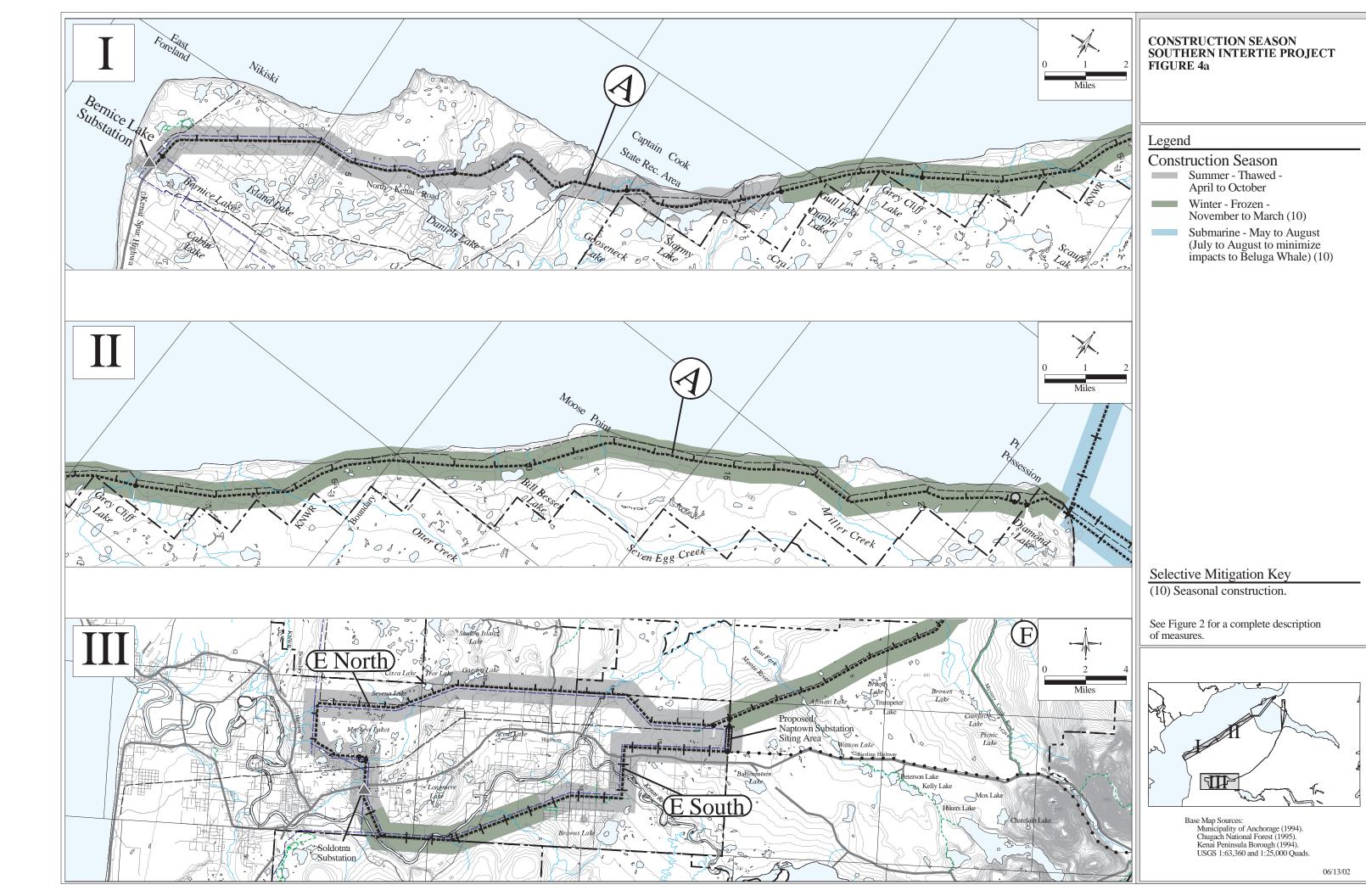
The impact mitigation summary table, Table 2 (follows Figure 7) documents the combined selective mitigation measures applied to the environmental receptors included in the DEIS, and summarizes the overall effectiveness of the mitigation measures. This table is intended to provide the reader with a breakdown of mitigation effectiveness by alternative route resource topics and concerns. Applicable mitigation measures and the site-specific features are also addressed in the table, and references are made to the applicable maps and resource topic (MV-2 through MV-31 in Volume II of the DEIS) that depict resource conditions.

FIGURES 3a TO 3c FIGURES 4a TO 4c FIGURES 5a TO 5c DESIGN AND CONSTRUCTION MITIGATION

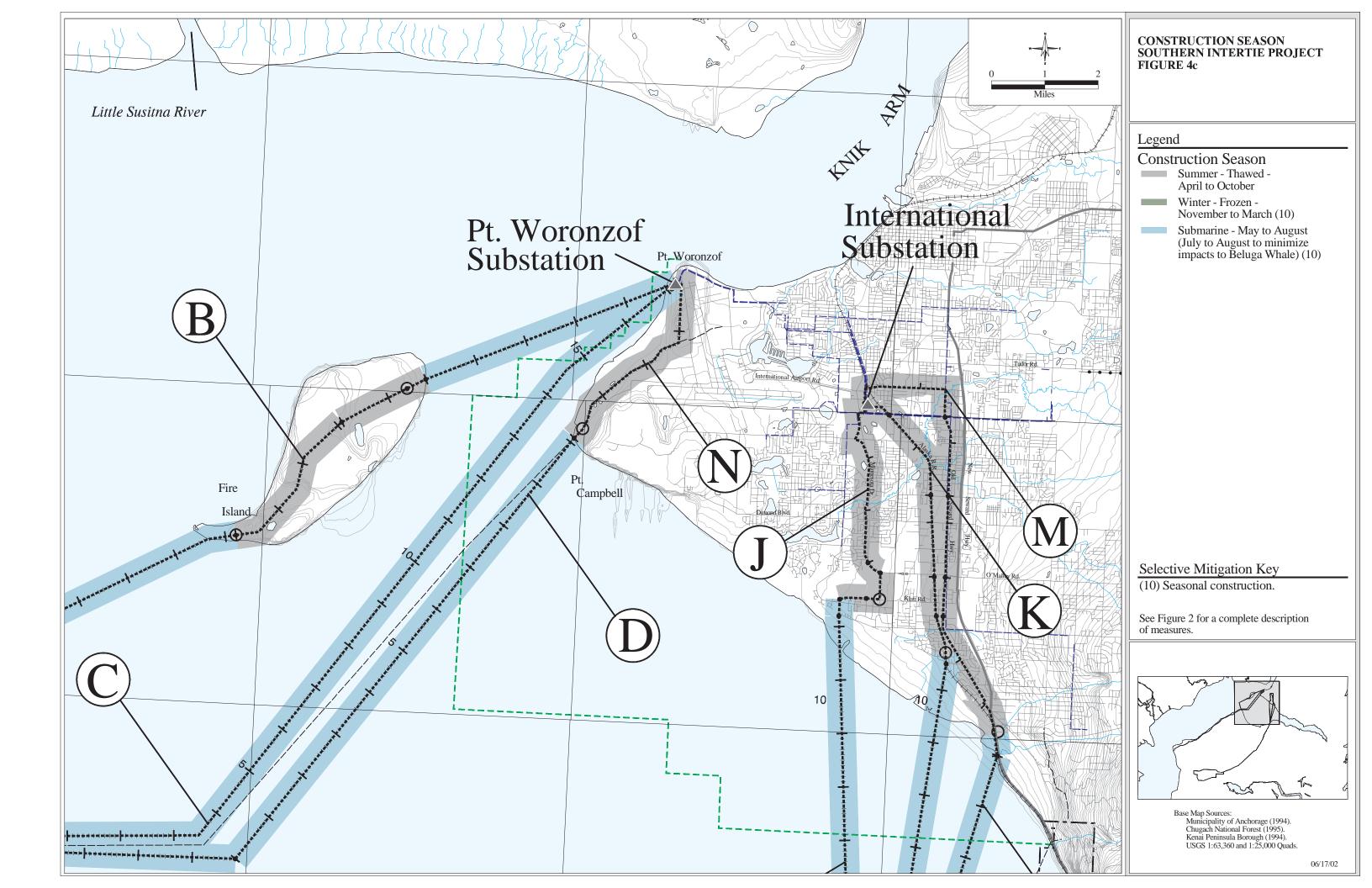


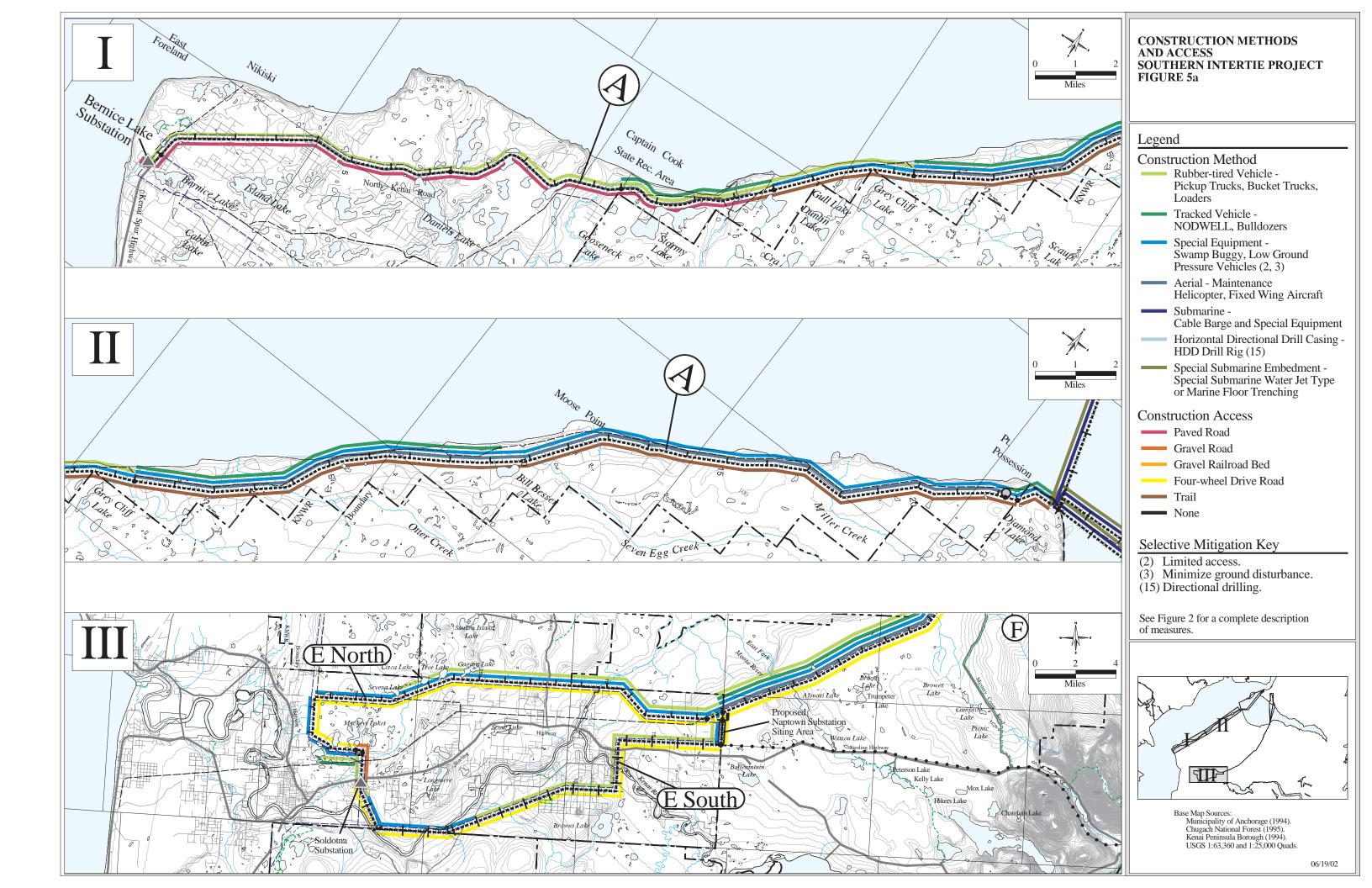


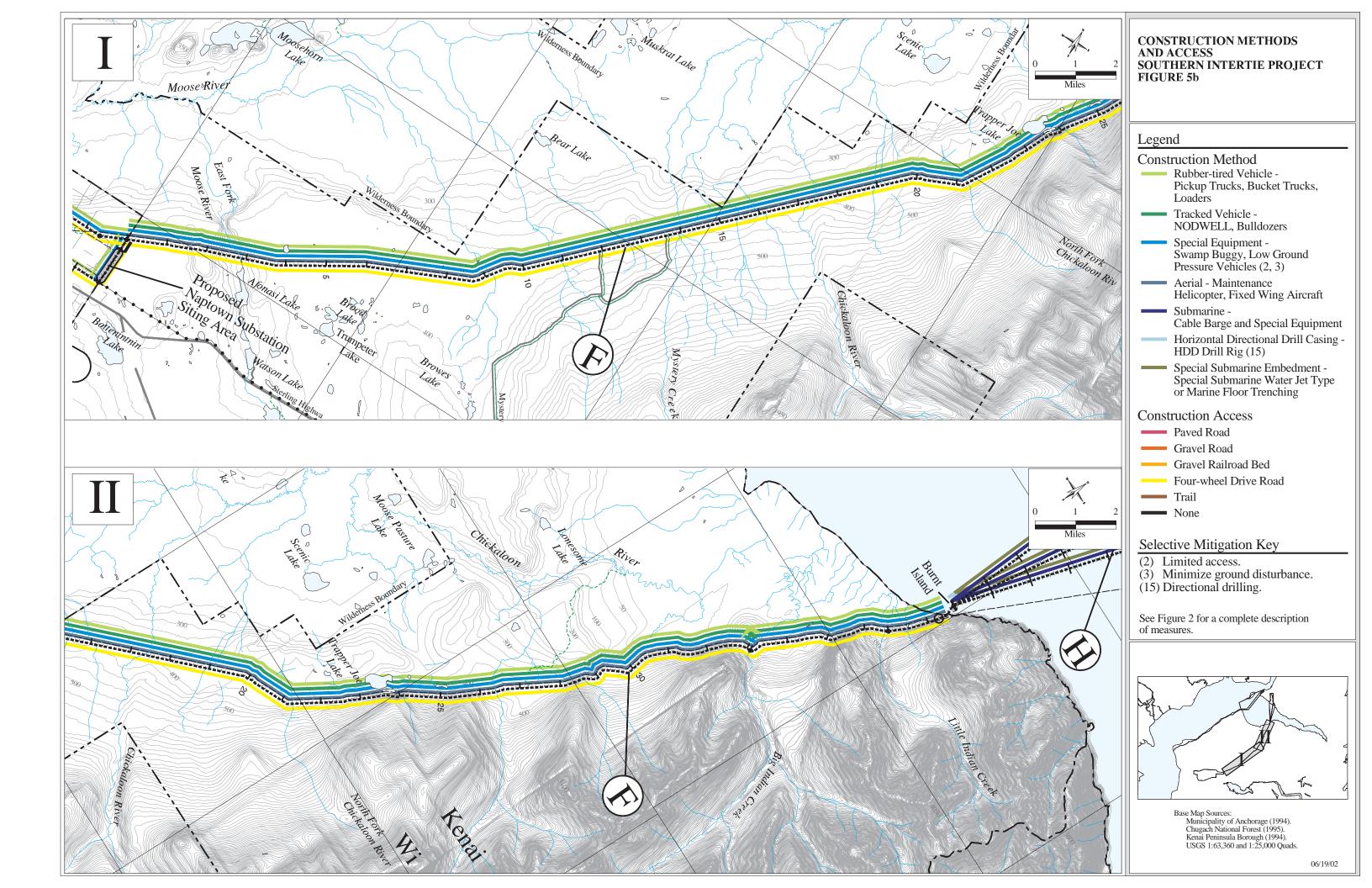


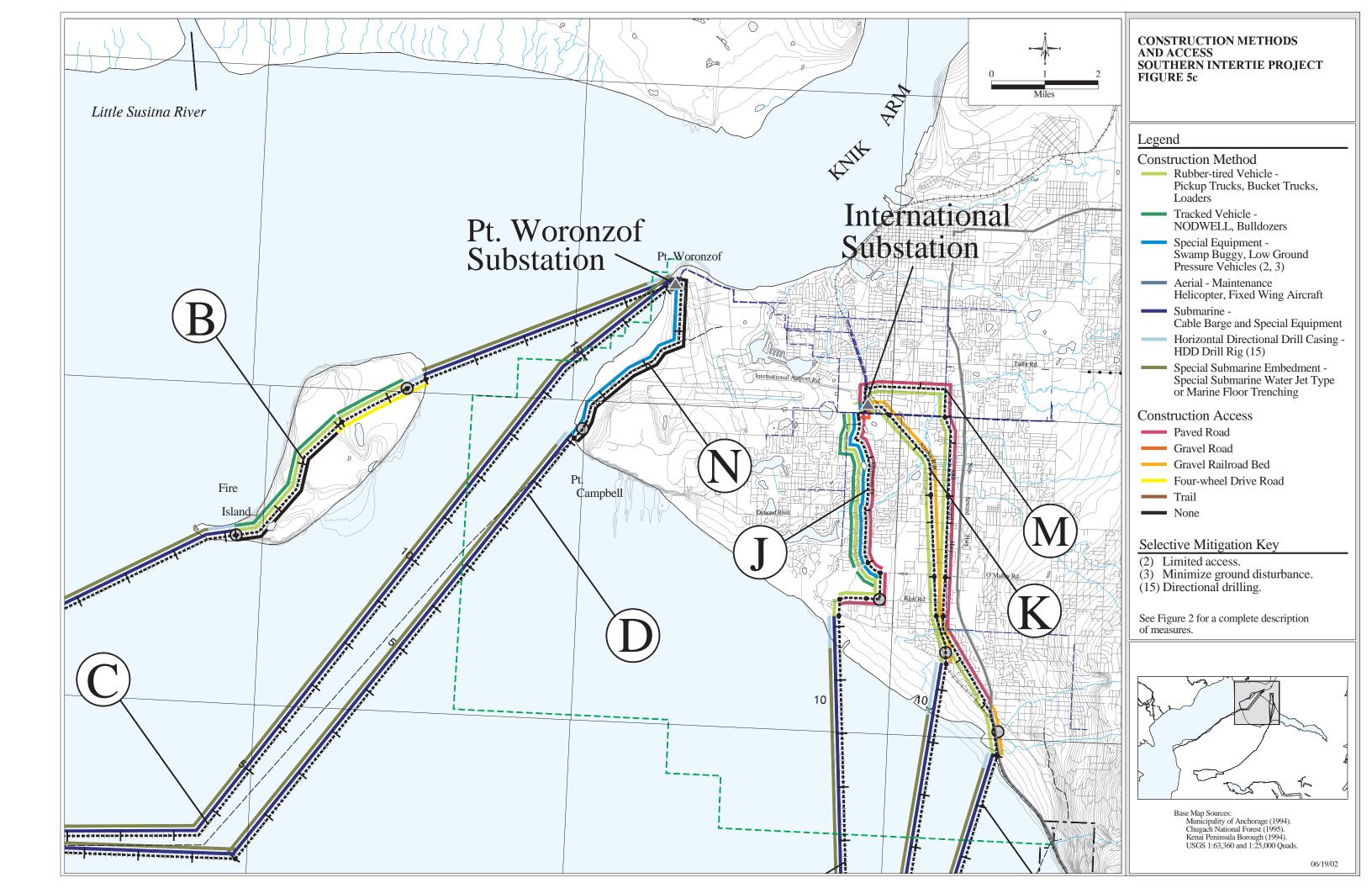


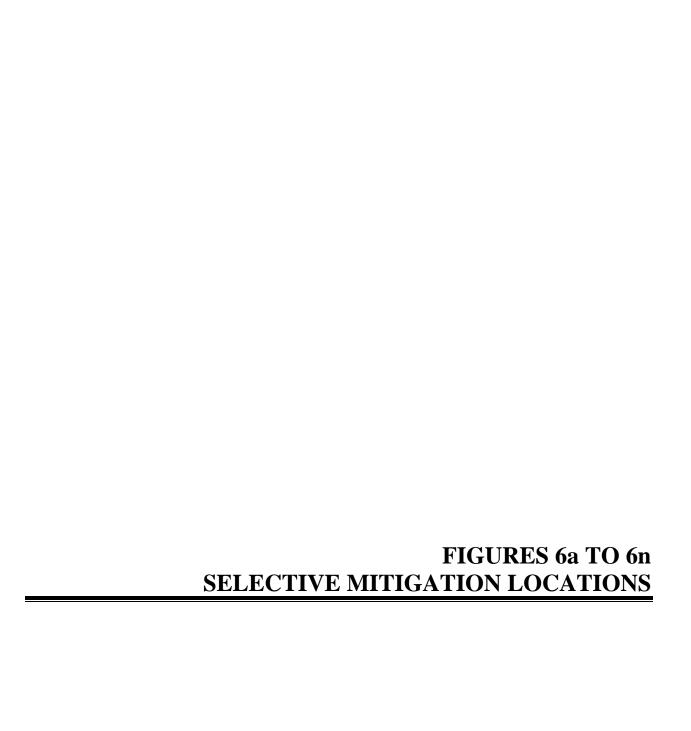












#### Route Option A: 44.1 Miles 0 Miles 5 10 15 20 25 30 35 40 44.1 Link T1 Link T8 Link T3 Link T4 Link T5 Link T6 Link T7 Link T2 Link T9 Captain Cook State –Bill Besser Lake – Section Corner of KNWR Recreation Area —Seven Egg Creek Pt. Possession -Otter Creek Private Airstrip Private Airstrip Bishop Creek Swanson River--Scaup Creek –Unnamed Stream – Miller Creek North Kenai Spur Road Right-of-Way **Gray Cliffs and Moose Point Subdivisions** Proposed Pt. Possession Subdivision Facility Siting Condition **KPB Transportation Utility Corridor** Facilities located within existing transportation or planned utility corridor Selective Mitigation\* 1. Limit upgrading of existing access roads 2. Use existing access for construction and maintenance 3. Align new access to landform contours - Does not apply -4. Close all access not required for maintenance 5. Modify tower design or use alternative tower type 6. Span sensitive features/realign route 7. Match existing tower spans Does not apply 8. Place towers at maximum distance from highway/trail crossing 9. Use dulled metal or corten finish on towers 10. Modify or curtail construction and maintenance during sensitive periods (i.e., use 10 winter construction) 11 11. Use helicopter maintenance of towers - Does not apply 12 12. Reduce or minimize right-of-way width 13. Selectively remove vegetation 14. Avoid construction near anadromous streams **O** during peak salmon run periods 15. Install submarine cables with horizontal 15 directional drilling 16. Place transmission lines underground 17. Place submarine to overhead transition facilities in context with surroundings and architecture 17 Does not apply 18 18. Design cable system for limited fluid loss 19. Mark lines for birds <del>-010-</del> 19 20. Bury small diameter fiber optic wires normally 20 Significant Residual Impacts (remaining with selective mitigation) Mitigation would substantially reduce potential for bird collision Birds - Bald Eagle, Trumpeter Swans, Significant visual impacts to existing residents Waterfowl (potentially effective) Variable visual impacts to developing area Legend **Selective Mitigation Measures** Mitigation to be applied Stream/creek/river crossing Tesoro Route: Option A ■■■ Mitigation to be applied in consultation Airstrip crossing

\* See Figure 2 for full definitions of selective mitigation measures

Submarine transition facility

with Kenai Peninsula Borough

Southern Intertie Project

anem intertie i rojet

#### Route Option B: 19.1 Miles 0 Miles 10 11 12 13 14 16 18 19 19.1 Link T10 Link T11 Link T14 Link T13 Pt. Possession Pt. Woronzof Fire Island Turnagain Arm Turnagain Arm **Facility Siting Conditions** Coastal Bluff Coastal Bluff Coastal Bluff Turnagain Arm and Fire Island Submarine Cable Overhead Line Along Existing Two-Track Road Submarine Cable Selective Mitigation\* 1. Limit upgrading of existing access roads 2. Use existing access for construction and maintenance 3. Align new access to landform contours Does not apply 4. Close all access not required for maintenance Does not apply 5. Modify tower design or use alternative tower type 6. Span sensitive features/realign route Does not apply 7. Match existing tower spans Does not apply 8. Place towers at maximum distance from highway/trail crossing Does not apply 9. Use dulled metal or corten finish on towers Does not apply 10. Modify or curtail construction and mainténance during sensitive periods (i.e., use winter construction) 11. Use helicopter maintenance of towers Does not apply 12. Reduce or minimize right-of-way width 13. Selectively remove vegetation 14. Avoid construction near anadromous streams Does not apply during peak salmon run periods 15. Install submarine cables with horizontal directional drilling Does not apply 16. Place transmission lines underground 17. Place submarine to overhead transition facilities in context with surroundings and architecture 18. Design cable system for limited fluid loss 19 Does not apply 19. Mark lines for birds 20. Bury small diameter fiber optic wires normally carried above conductors 20 $\vdash$ Does not apply -Significant Residual Impacts (remaining with selective mitigation)

None

# Legend



Mitigation to be applied Submarine transition facility

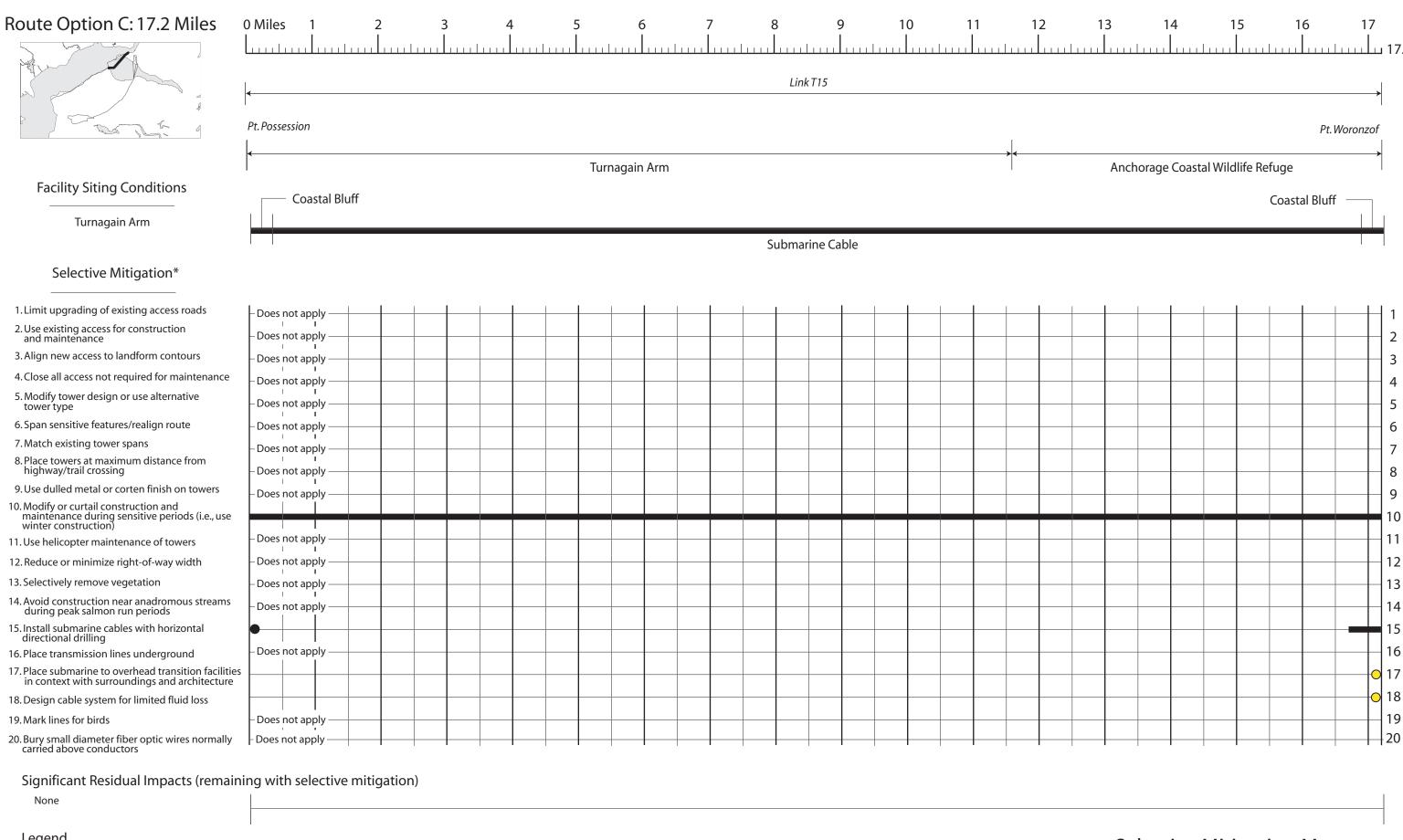
**Selective Mitigation Measures** Tesoro Route: Option B

Southern Intertie Project

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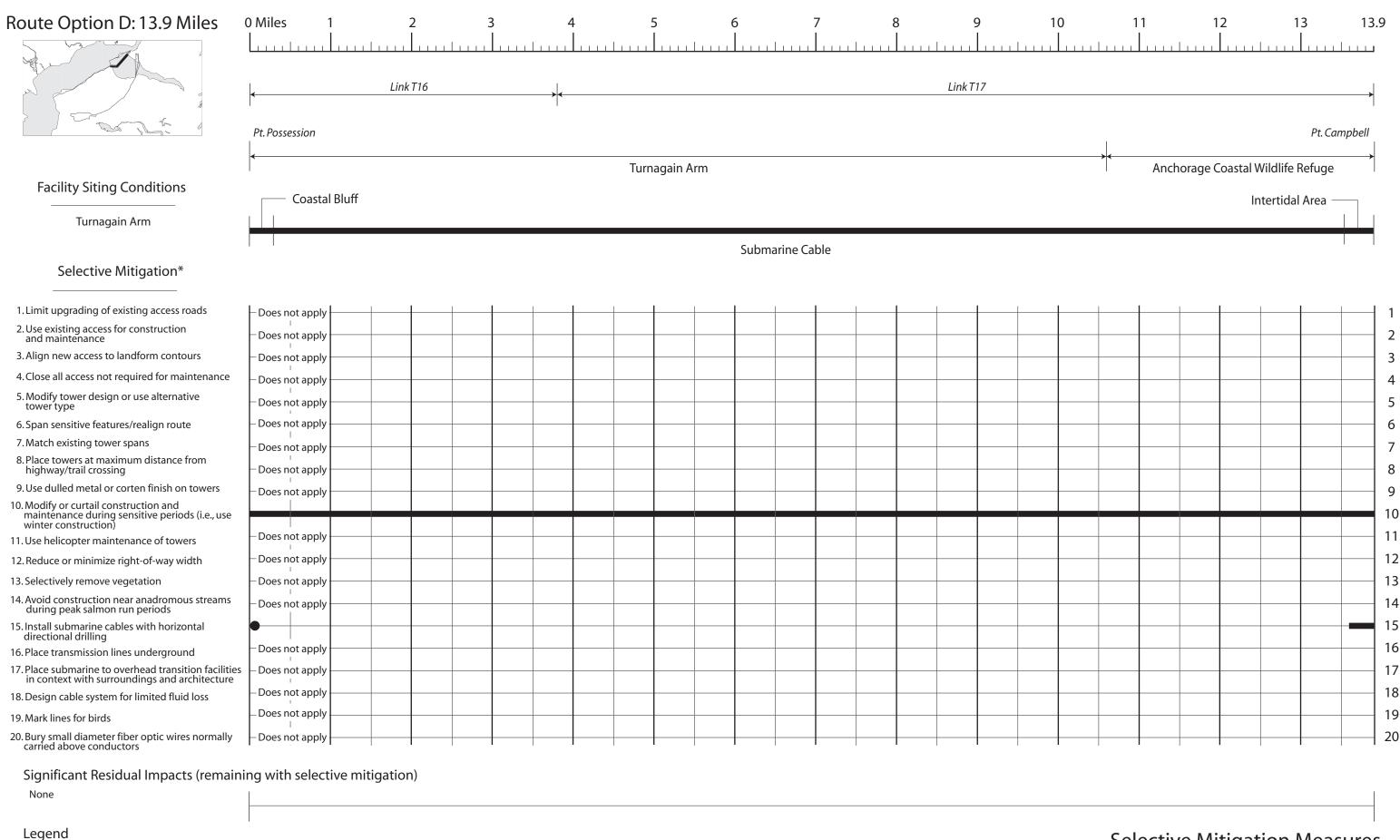
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Legend

Mitigation to be applied Submarine transition facility **Selective Mitigation Measures** 

Tesoro Route: Option C



\* See Figure 2 for full definitions of selective mitigation measures

Mitigation to be applied

**Selective Mitigation Measures** 

Tesoro Route: Option D

#### **Route Option E North:** 0 Miles 21 21.6 21.6 Miles Link E4 Link E3 **Unnamed Stream** Soldotna Creek Moose River Soldotna Creek - Unnamed Stream Swanson River Road Soldotna Sterling Facility Siting Conditions Parallel to two 115kV Lines Existing utility corridor Parallel to 115kV Selective Mitigation\* Parallel to two 115kV, 69kV Lines Parallel to 115kV, Pipeline Parallel to Enstar Pipelines 1. Limit upgrading of existing access roads 2. Use existing access for construction and maintenance 3. Align new access to landform contours Does not apply 3 4. Close all access not required for maintenance Does not apply 5. Modify tower design or use alternative tower type 6. Span sensitive features/realign route 7. Match existing tower spans 8. Place towers at maximum distance from 8 highway/trail crossing 9. Use dulled metal or corten finish on towers 9 Does not apply 10. Modify or curtail construction and Does not apply 10 maintenance during sensitive periods (i.e., use winter construction) Does not apply 11. Use helicopter maintenance of towers 12 Does not apply 12. Reduce or minimize right-of-way width 13 13. Selectively remove vegetation 14. Avoid construction near anadromous streams during peak salmon run periods - Does not apply 15 15. Install submarine cables with horizontal directional drilling 16 Does not apply 16. Place transmission lines underground 17. Place submarine to overhead transition facilities in context with surroundings and architecture 17 Does not apply 18 - Does not apply 18. Design cable system for limited fluid loss 19 19. Mark lines for birds 20. Bury small diameter fiber optic wires normally - Does not apply Significant Residual Impacts (remaining with selective mitigation) Visual- Landscape scenery Residential viewers Legend Mitigation to be applied

Road/highway crossing

Stream/creek/river crossing

Selective Mitigation Measures
Enstar Route: Option E North

#### Route Option E South: 0 9 10 15 18 19 12 13 14 16 17 19.0 Miles Link E5 Kenai River/ Bing's Landing **Unnamed Stream** Funny River Road Kenai River - Funny River Sterling Highway Soldotna Sterling Facility Siting Conditions Existing utility corridor Rebuild 69kV Line Selective Mitigation\* 1. Limit upgrading of existing access roads 2. Use existing access for construction and maintenance 3. Align new access to landform contours Does not apply 4. Close all access not required for maintenance - Does not apply 5. Modify tower design or use alternative tower type 6. Span sensitive features/realign route 0 7. Match existing tower spans

highway/trail crossing

9. Use dulled metal or corten finish on towers

8. Place towers at maximum distance from

 Modify or curtail construction and maintenance during sensitive periods (i.e., use winter construction)

11. Use helicopter maintenance of towers

12. Reduce or minimize right-of-way width

13. Selectively remove vegetation

14. Avoid construction near anadromous streams during peak salmon run periods

15. Install submarine cables with horizontal directional drilling

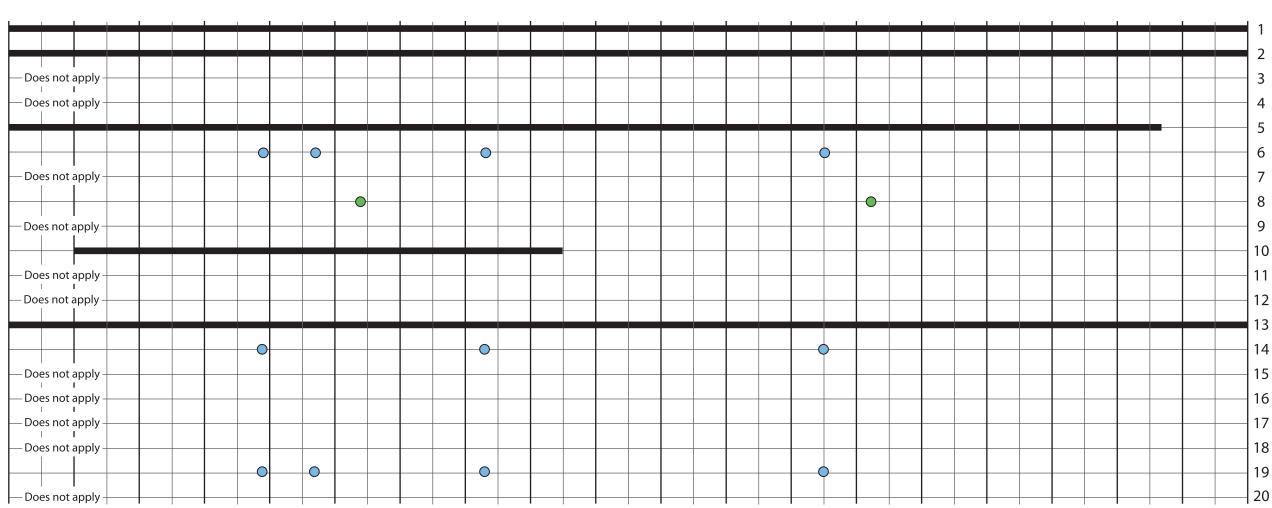
16. Place transmission lines underground

17. Place submarine to overhead transition facilities in context with surroundings and architecture

18. Design cable system for limited fluid loss

19. Mark lines for birds

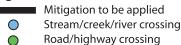
20. Bury small diameter fiber optic wires normally carried above conductors



# Significant Residual Impacts (remaining with selective mitigation)

Visual- Landscape scenery Residential viewers

#### Legend



Selective Mitigation Measures
Enstar Route: Option E South
Southern Intertie Project

<sup>\*</sup> See Figure 2 for full definitions of selective mitigation measures

#### Route Option F: 38.5 Miles 10 15 20 25 30 35 38.5 Link E8 Link E9 Link E10 North Fork Mystery Creek Road **Burnt Island Creek** Chickaloon River Mystery Creek Road Mystery Creek - Chickaloon River East Fork Moose River Little Indian Creek Big Indian Creek — Trapper Joe Lake Burnt Island Kenai National Wildlife Refuge Unnamed Stream Crossing **Facility Siting Conditions** Parallel to Enstar Pipelines Selective Mitigation\* 1. Limit upgrading of existing access roads 2. Use existing access for construction and maintenance 3. Align new access to landform contours Does not apply 4. Close all access not required for maintenance Does not apply 5. Modify tower design or use alternative tower type 6. Span sensitive features/realign route 00-0 0-0 $\circ$ 7. Match existing tower spans Does not apply 8. Place towers at maximum distance from highway/trail crossing Does not apply 9. Use dulled metal or corten finish on towers 9 10. Modify or curtail construction and maintenance during sensitive periods (i.e., use 10 winter construction) 11 11. Use helicopter maintenance of towers 12 12. Reduce or minimize right-of-way width 13. Selectively remove vegetation 13 14. Avoid construction near anadromous streams 14 during peak salmon run periods 15. Install submarine cables with horizontal 15 directional drilling 16 Does not apply 16. Place transmission lines underground 17. Place submarine to overhead transition facilities 17 Does not apply in context with surroundings and architecture 18 18. Design cable system for limited fluid loss 19 19. Mark lines for birds 0-0-20. Bury small diameter fiber optic wires normally carried above conductors Significant Residual Impacts (remaining with selective mitigation)

Vegetation Brown Bear, Moose, Predators Wetlands (potentially effective) Land Use and Recreation Visual

# Legend

Mitigation to be applied Stream/creek/river crossing Submarine transition facility

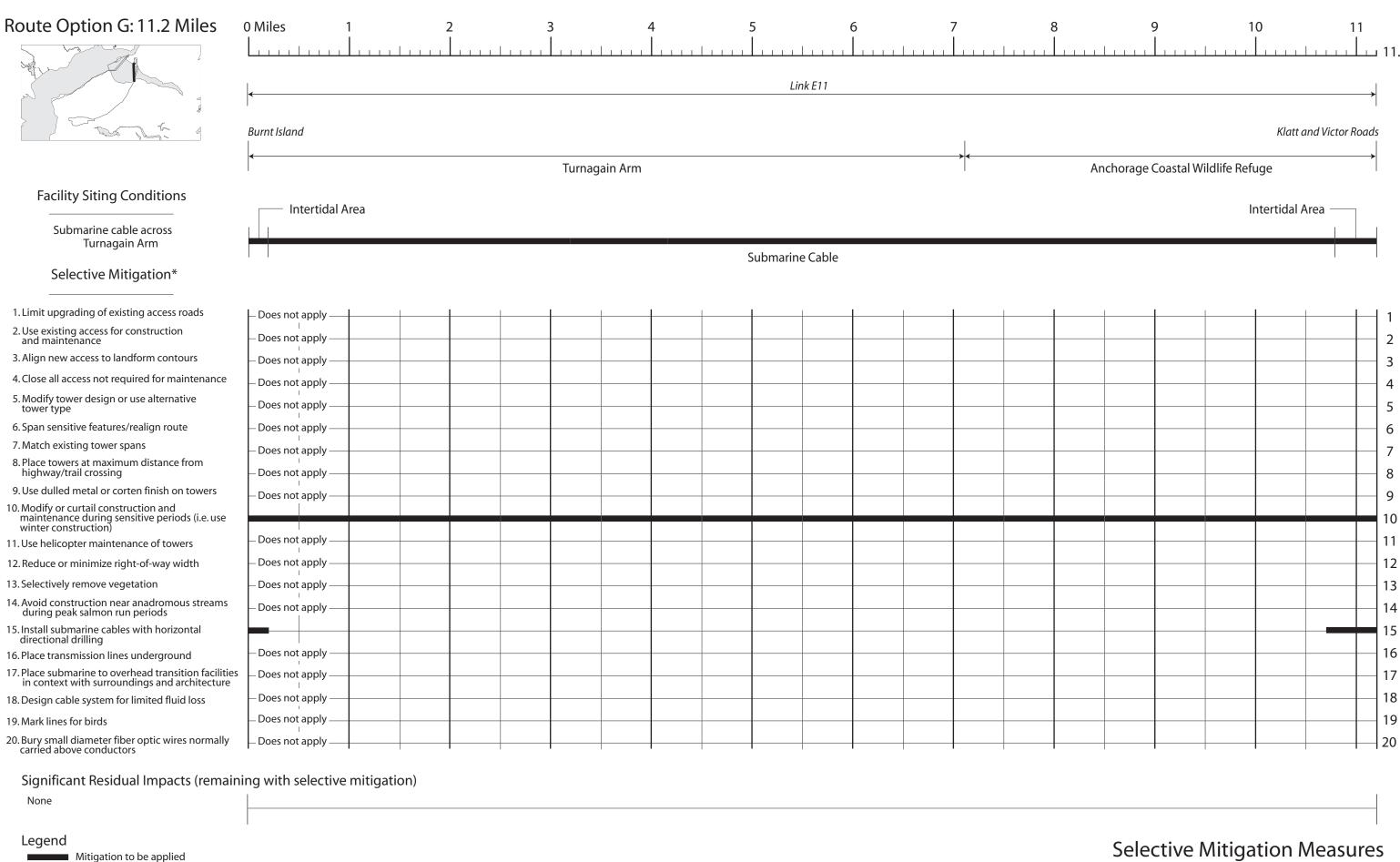
Birds - Bald Eagle, Trumpeter Swans, Waterfowl (potentially effective)

\* See Figure 2 for full definitions of selective mitigation measures

Selective Mitigation Measures **Enstar Route: Option F** 

Southern Intertie Project

FIGURE 6q



\* See Figure 2 for full definitions of selective mitigation measures

**Selective Mitigation Measures** Enstar Route: Option G

#### Route Option H: 10.5 Miles 0 Miles 10 10.5 Link E12 Burnt Island Oceanview Bluff Park Turnagain Arm Anchorage Coastal Wildlife Refuge **Facility Siting Conditions** Intertidal Area Intertidal Area Submarine cable across Turnagain Arm Submarine Cable Selective Mitigation\* 1. Limit upgrading of existing access roads Does not apply 2. Use existing access for construction and maintenance Does not apply 3. Align new access to landform contours 3 Does not apply 4. Close all access not required for maintenance Does not apply 5. Modify tower design or use alternative tower type Does not apply 6. Span sensitive features/realign route Does not apply 7. Match existing tower spans Does not apply 8. Place towers at maximum distance from highway/trail crossing 8 Does not apply 9. Use dulled metal or corten finish on towers 9 Does not apply 10. Modify or curtail construction and maintenance during sensitive periods (i.e., use winter construction) 11 11. Use helicopter maintenance of towers Does not apply 12. Reduce or minimize right-of-way width 12 Does not apply 13. Selectively remove vegetation 13 Does not apply 14. Avoid construction near anadromous streams 14 Does not apply during peak salmon run periods 15. Install submarine cables with horizontal 15 directional drilling Does not apply 16 16. Place transmission lines underground 17. Place submarine to overhead transition facilities in context with surroundings and architecture 17 Does not apply 18 18. Design cable system for limited fluid loss Does not apply 19. Mark lines for birds 19 Does not apply 20. Bury small diameter fiber optic wires normally 20 - Does not apply carried above conductors Significant Residual Impacts (remaining with selective mitigation) None Legend **Selective Mitigation Measures** Mitigation to be applied

\* See Figure 2 for full definitions of selective mitigation measures

Enstar Route: Option H

#### Route Option I: 9.0 Miles 0 Miles Link E13 **Burnt Island** Rabbit Creek Anchorage Coastal Wildlife Refuge Turnagain Arm **Facility Siting Conditions** Intertidal Area Intertidal Area Submarine cable across Turnagain Arm Submarine Cable Selective Mitigation\* 1. Limit upgrading of existing access roads Does not apply 2. Use existing access for construction and maintenance Does not apply 3. Align new access to landform contours Does not apply 4. Close all access not required for maintenance Does not apply 5. Modify tower design or use alternative tower type Does not apply Does not apply 6. Span sensitive features/realign route 7. Match existing tower spans Does not apply 8. Place towers at maximum distance from Does not apply highway/trail crossing 9. Use dulled metal or corten finish on towers Does not apply 10. Modify or curtail construction and maintenance during sensitive periods (i.e., use winter construction) Does not apply 11. Use helicopter maintenance of towers Does not apply 12 12. Reduce or minimize right-of-way width 13. Selectively remove vegetation Does not apply 14. Avoid construction near anadromous streams Does not apply during peak salmon run periods 15. Install submarine cables with horizontal directional drilling Does not apply 16. Place transmission lines underground 17. Place submarine to overhead transition facilities Does not apply in context with surroundings and architecture 18 Does not apply 18. Design cable system for limited fluid loss 19 Does not apply 19. Mark lines for birds 20. Bury small diameter fiber optic wires normally Does not apply 20 carried above conductors Significant Residual Impacts (remaining with selective mitigation) None Legend **Selective Mitigation Measures** Mitigation to be applied

\* See Figure 2 for full definitions of selective mitigation measures

**Enstar Route: Option I** 

Southern Intertie Project

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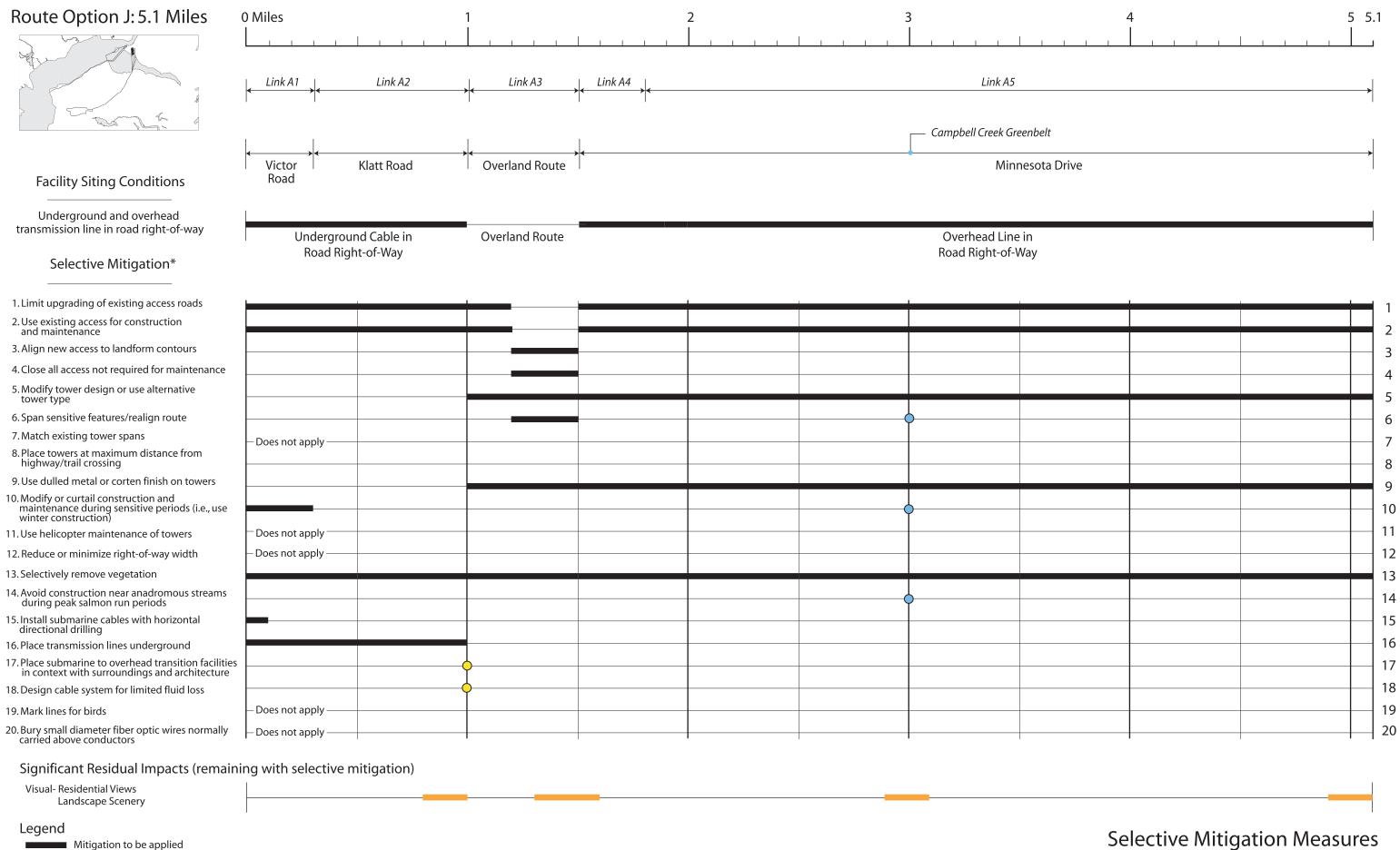
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Stream/creek/river/greenbelt crossing

Submarine transition facility

**Selective Mitigation Measures** 

**Enstar Route: Option J** 

Southern Intertie Project

FIGURE 6k

#### Route Option K: 5.4 Miles 0 Miles 5.4 Link A6 Link A7 Link A8 Link A9 Link A10 - Oceanview Park O'Malley Road Campbell Creek Greenbelt Flying Crown Airstrip Alaska Railroad Right-of-Way **Facility Siting Conditions** Underground and overhead lines in railroad right-of-way Underground Line in Overhead Line in Right-of-Way Railroad Right-of-Way Selective Mitigation\* 1. Limit upgrading of existing access roads 2. Use existing access for construction and maintenance 3. Align new access to landform contours Does not apply 4. Close all access not required for maintenance Does not apply 5. Modify tower design or use alternative tower type 6. Span sensitive features/realign route 7. Match existing tower spans Does not apply 8. Place towers at maximum distance from highway/trail crossing - Does not apply -9. Use dulled metal or corten finish on towers 10. Modify or curtail construction and maintenance during sensitive periods (i.e., use winter construction) Does not apply 11. Use helicopter maintenance of towers Does not apply 12. Reduce or minimize right-of-way width 13. Selectively remove vegetation 14. Avoid construction near anadromous streams during peak salmon run periods 15. Install submarine cables with horizontal directional drilling 16. Place transmission lines underground 17. Place submarine to overhead transition facilities in context with surroundings and architecture Does not apply 18. Design cable system for limited fluid loss - Does not apply 19. Mark lines for birds 20. Bury small diameter fiber optic wires normally - Does not apply carried above conductors Significant Residual Impacts (remaining with selective mitigation) Campbell Creek Visual- Residential views Landscape scenery Legend Mitigation to be applied

\* See Figure 2 for full definitions of selective mitigation measures

Stream/creek/river crossing

Submarine transition facility

# **Selective Mitigation Measures**

**Enstar Route: Option K** 

Southern Intertie Project

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#### Route Option M: 8.9 Miles 0 Miles 8.9 Link A11 Link A14 Link A15 Link A16 Link A13 Rabbit Creek O'Malley Road **Unnamed Stream** Campbell Creek Greenbelt **New Seward** Old Seward Highway International Airport Boulevard Highway **Facility Siting Conditions** Rebuild distribution lines in road right-of-way New Line in Road Right-of-Way Underground Rebuild Overhead Line in Right-of-Way Cable in Road Selective Mitigation\* Right-of-Way 1. Limit upgrading of existing access roads 2. Use existing access for construction 3. Align new access to landform contours - Does not apply 4. Close all access not required for maintenance - Does not apply 5. Modify tower design or use alternative tower type 6. Span sensitive features/realign route 7. Match existing tower spans - Does not apply -8. Place towers at maximum distance from highway/trail crossing 9. Use dulled metal or corten finish on towers 10. Modify or curtail construction and maintenance during sensitive periods (i.e., use 10 winter construction) 11. Use helicopter maintenance of towers 11 -Does not apply 12. Reduce or minimize right-of-way width 12 Does not apply 13. Selectively remove vegetation 13 14. Avoid construction near anadromous streams 14 during peak salmon run periods 15. Install submarine cables with horizontal 15 directional drilling 16. Place transmission lines underground 16 17. Place submarine to overhead transition facilities 17 - Does not apply in context with surroundings and architecture 18. Design cable system for limited fluid loss 18 19. Mark lines for birds 19 - Does not apply 20. Bury small diameter fiber optic wires normally 20 – Does not apply carried above conductors Significant Residual Impacts (remaining with selective mitigation) Visual-Residential views Landscape scenery Legend Selective Mitigation Measures Mitigation to be applied Stream/creek/river/greenbelt crossing

\* See Figure 2 for full definitions of selective mitigation measures

Road/highway crossing Transition facility

**Enstar Route: Option M** 

Southern Intertie Project

#### Route Option N: 4.0 Miles 0 Miles Link T18 Tony Knowles Coastal Trail Pt. Woronzof Substation Pt. Campbell Kincaid Park **Tesoro Pipeline Planned Airport Road** Coastal Trail Crossing Coastal Trail Crossing **Facility Siting Conditions** Coastal Bluff Underground line parallel to Tesoro Pipeline Underground Line Parallel to Planned Road Maintain Buffer and Separation From Coastal Trail - Underground Line Parallel to Tesoro Pipeline Selective Mitigation\* 1. Limit upgrading of existing access roads 2. Use existing access for construction and maintenance 3. Align new access to landform contours 4. Close all access not required for maintenance 5. Modify tower design or use alternative tower type Does not apply 6. Span sensitive features/realign route 7. Match existing tower spans Does not apply 8. Place towers at maximum distance from highway/trail crossing Does not apply 9. Use dulled metal or corten finish on towers Does not apply 10. Modify or curtail construction and maintenance during sensitive periods (i.e., use winter construction) 11. Use helicopter maintenance of towers Does not apply 12. Reduce or minimize right-of-way width Does not apply 13. Selectively remove vegetation 14. Avoid construction near anadromous streams Does not apply during peak salmon run periods 15. Install submarine cables with horizontal directional drilling 16. Place transmission lines underground 17. Place submarine to overhead transition facilities Does not apply in context with surroundings and architecture 18. Design cable system for limited fluid loss 19. Mark lines for birds Does not apply 20. Bury small diameter fiber optic wires normally - Does not apply Significant Residual Impacts (remaining with selective mitigation) None Legend Mitigation to be applied

\* See Figure 2 for full definitions of selective mitigation measures

Submarine transition facility

■ ■ ■ Mitigation to be applied in coordination with Municipality of Anchorage and Airport Authority

Selective Mitigation Measures Tesoro Route: Option N

Southern Intertie Project

FIGURE 6n

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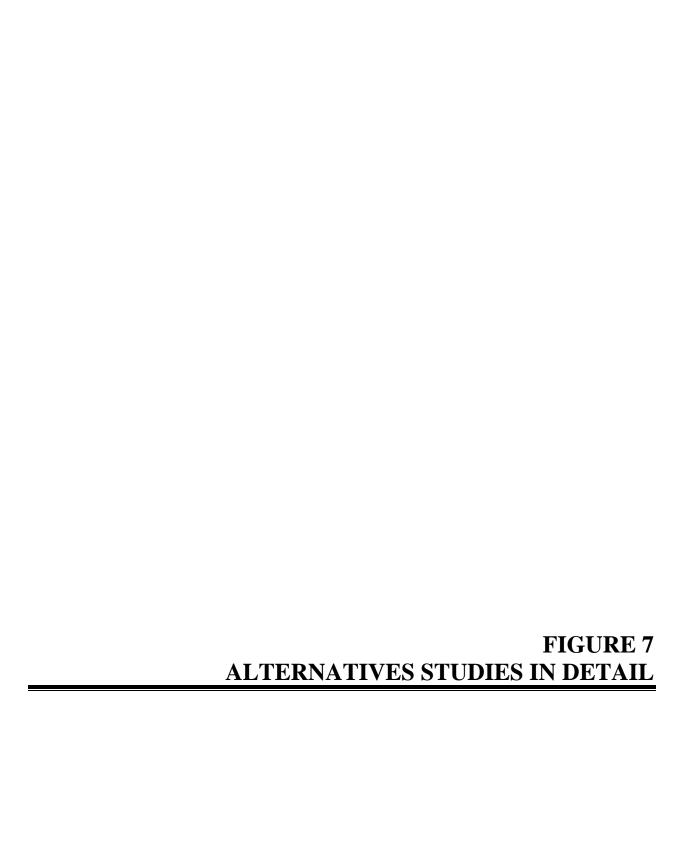
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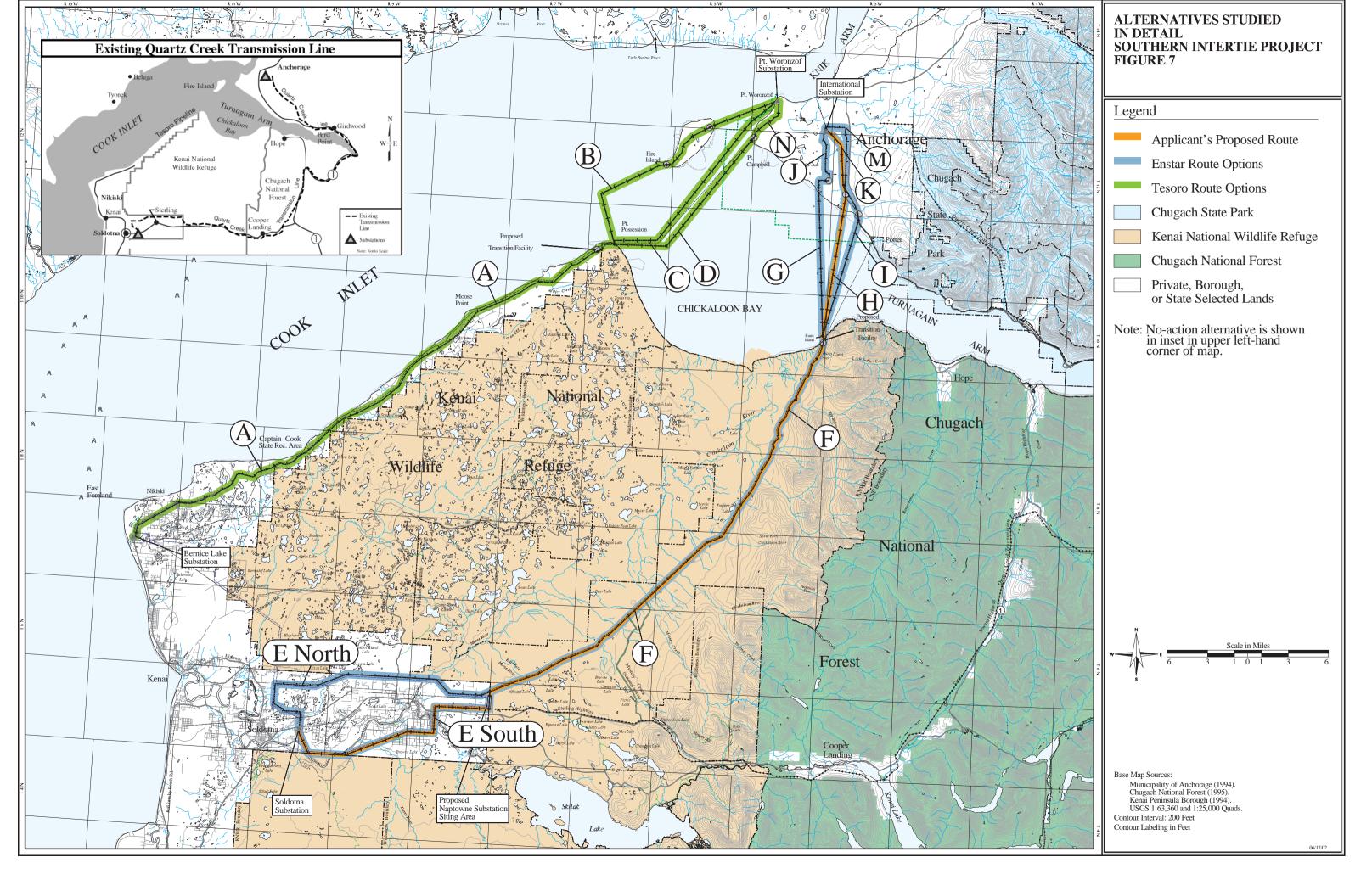
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Alternative	Resource Topic on Referenced Map and Map Legend Features	Applicable Selective Mitigation Measures	Key Site-Specific Features or General Areas and Mitigation	Mitigation Effectiveness
Earth and Wat	er Resources: Earth Resour	ces Maps, Figures MV	- 2,3,4 (Volume II of the DEIS)	
Tesoro	Compressible soils (Qc)	1, 10	Dispersed	Impacts mitigated based on the use of existing access, tracked and low ground pressure vehicles, special equipment, and winter construction.  Results - Highly effective
	Slope Instability (Qg, Qs)	15	Pt. Possession and Pt Campbell– horizontal directional drilling	Impacts mitigated as structural impacts are avoided through horizontal directional drilling at Pt. Possession and Pt. Campbell.  Results – Highly effective
	Stream Crossings	6, 10, 15, 16	Bishop Ck – span Swanson River – bore or attach to bridge Scup Ck – span Otter Ck – span Seven Egg Ck – span Miller Ck – span	Impacts mitigated by spanning streams (minimum 200' setback including the placement of foundations and structures), and temporary manmade and ice bridges. If local conditions do not allow for ice bridges, snow will either be brought in, or construction suspended.  Results – Highly effective
Enstar	Compressible soils (Qc)	1, 10	Chickaloon marsh, Rabbit Ck, Oceanview and Klatt Rd salt marsh crossings – horizontal directional drilling	Same as Tesoro Route
	Slope Instability (Qg, Qs)	15	Oceanview Park – horizontal directional drilling	Same as Tesoro Route

Alternative	Resource Topic on Referenced Map and Map Legend Features	Applicable Selective Mitigation Measures	Key Site-Specific Features or General Areas and Mitigation	Mitigation Effectiveness
Enstar (cont.)	Stream Crossings	6, 10, 15, 16	Moose River drainage area (4 crossings) - span East Fork Moose River (3 crossings) - span Chickaloon River drainage area (7 crossings) - span Mystery Creek - span Chickaloon River drainage area (5 crossings) - span Big Indian Creek - span Little Indian Creek - span Burnt Island Creek - span Kenai River (2 crossings) - span Funny River - span Soldotna Ck (3 crossings) - span Moose River -span 2 unnamed ck crossings - span	Same as Tesoro Route

Alternative	Resource Topic on Referenced Map and Map Legend Features	Applicable Selective Mitigation Measures	Key Site-Specific Features or General Areas and Mitigation	Mitigation Effectiveness
Wetlands: Veg	getation Cover/Wetlands Map,	Figures M- 6,7,8 (V	olume II of the DEIS)	
Tesoro	All types listed under wetlands, bogs and meadows	1, 2, 6, 10, 15	Pt. Campbell salt marsh crossings – horizontal directional drilling	Impacts to Anchorage Coastal Wildlife Refuge salt marsh are mitigated by avoidance through directional drilling and impacts to wetlands, bogs and meadows will be substantially reduced by winter construction, use of existing access, tracked and low ground pressure vehicles and special equipment.  Results - Highly effective, and Tesoro is considered the less damaging practicable alternative, without significant impacts to aquatic resources (USACE Draft Section 404(b)(1) Evaluation results, Appendix B in FEIS Volume I)
Enstar	All types listed under wetlands, bogs and meadows	1, 2, 6, 10, 15	Chickaloon marsh, Rabbit Ck and Oceanview salt marshes crossings – horizontal directional drilling	Impacts to Chickaloon marsh, and Anchorage Coastal Wildlife Refuge salt marshes are mitigated by avoidance through directional drilling. While impacts to wetlands, bogs and meadows will be substantially reduced by winter construction, use of existing access, tracked and low ground pressure vehicles and special equipment, any impacts on these areas within the KNWR would be at a national level due to conflicts with the USFWS mandate to protect wildlife and their habitats on the KNWR.  Results – Highly effective during construction, less effective at wetland crossings during operation and maintenance along Mystery Creek trail within KNWR, also more extensive presence of wetlands

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Alternative	Resource Topic on Referenced Map and Map Legend Features	Applicable Selective Mitigation Measures	Key Site-Specific Features or General Areas and Mitigation	Mitigation Effectiveness
Upland Vegeta	ntion: Vegetation Cover/Wetl	ands Map, Figures M	- 6,7,8 (Volume II of the DEIS)	
Tesoro	All types listed under Uplands	1, 6, 10, 13	Spruce bark beetle and mitigation including disposal of logs and slash	Impacts on upland vegetation will be reduced by not improving existing roads, minimizing clearing of the right-of-way, and selective removal of vegetation with the right-of-way. In order to discourage spruce bark beetle infestation, spruce logs and slash from clearing in closed mixed forests would be chipped, dispersed or hauled away.  Results – Partially effective
Enstar	All types listed under Uplands	1, 6, 10, 13	Spruce bark beetle and mitigation including disposal of logs and slash	Same as for the Tesoro route, however, any impacts on areas within the KNWR would be at a national level due to conflicts with the USFWS mandate to protect wildlife and their habitats on the KNWR.  Results – Less effective than Tesoro due to poor existing access conditions and denser vegetative cover on steep slopes, especially in the Indian Creek Area

	Resource Topic on	Applicable Selective		
	Referenced Map and	Mitigation	Key Site-Specific Features or	
Alternative	Map Legend Features	Measures	General Areas and Mitigation	Mitigation Effectiveness
Waterfowl: W	aterfowl Distribution Map (19	68-2000), Figure MV	- 9, and Vegetation Cover/Wetlands Ma	p, Figures MV – 6,7,8 (Volume II of the DEIS)
Tesoro	Open bodies of water outside of forest or woodland areas (MV 6, 7, 8) and stream or river crossings	1, 5, 10, 19, 20	In areas within 1,312 feet of open bodies of water and wetlands (non- forested or non- developed), lines will be marked	Mitigation measures (marking wires) will reduce the potential for collision mortality, and disturbance to nesting birds is minimized through limiting access and seasonal construction  Results – Substantially reduced potential for bird collision
Enstar	Spring and fall concentration and staging areas, open bodies of water outside of forest or woodland areas (MV 6, 7, 8) within 1,312 feet of alignment and stream or river crossings	1, 5, 10, 19, 20	In areas within 1,312 feet of open bodies of water and wetlands (nonforested or non-developed), lines will be marked Near Chickaloon Flats concentration and staging areas (70') poles are prescribed between links E 9 and E 10	Same as for the Tesoro route, including the installation of 70- foot high poles adjacent to the Chickaloon marsh lands, however any impacts on waterfowl within the KNWR would be at a national level due to conflicts with the USFWS mandate to protect wildlife and their habitats on the KNWR.  Results – Substantially reduced potential for bird collision
Trumpeter Sw	vans: Nesting Area for Trump	eter Swans Map, Figu	re MV-10 (Volume II of the DEIS)	
Tesoro	Nesting and brood rearing areas with a 2-mile influence zone	1, 2, 10, 13, 19, 20	Avoid nesting areas by at least 1-mile during nesting season and mark wires within 1,312 feet of nest sites in non-forested, non-developed areas	Avoiding spring construction and maintenance, recorded nesting areas and breeding periods and selective mitigation measures (marking, limiting access) will reduce the potential for collision mortality, and disturbance to nesting birds.  Results – Substantially reduced potential for bird collision
Enstar	Nesting and brood rearing areas with a 2-mile influence zone	1, 2, 10, 13, 19, 20	Avoid nesting areas by at least 1-mile during nesting season and mark wires within 1,312 feet of nest sites in non-forested, non-developed areas	Same as for the Tesoro route, however any impacts on Trumpeter Swans within the KNWR would be at a national level due to conflicts with the USFWS mandate to protect wildlife and their habitats on the KNWR.  Results – Substantially reduced potential for bird collision

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	Resource Topic on	Applicable Selective		
	Referenced Map and	Mitigation	<b>Key Site-Specific Features or</b>	
Alternative	Map Legend Features	Measures	General Areas and Mitigation	Mitigation Effectiveness
Bald Eagles: N	lesting Areas for Bald Eagles	(1979 – 2000), Figure	MV-10 (Volume II of the DEIS)	
Tesoro	Bald Eagle known nesting areas within a 0.5 influence zone	1, 2, 6, 10, 13, 14	Avoid any clearing within primary nest zone – 0.25 mile and avoid construction activities during nesting within – 0.5 mile	Avoiding spring construction and maintenance, recorded nesting areas and breeding periods and selective mitigation measures will reduce the potential for collision mortality, and disturbance to nesting birds.  Results – Substantially reduced potential for bird collision
Enstar	Bald Eagle known nesting areas within a 0.5 influence zone	1, 2, 6, 10, 13, 14	Avoid any clearing within primary nest zone – 0.25 mile And avoid construction activities during nesting within – 0.5 mile	Same as Tesoro Route, however any impacts on Bald Eagles within the KNWR would be at a national level due to conflicts with the USFWS mandate to protect wildlife and their habitats on the KNWR.  Results – Substantially reduced potential for bird collision
Lynx and Wol	ves: Lynx Distribution Map,	Figure MV-11 and Wo	olf Distribution Map, Figure MV-12 (Vo	olume II of the DEIS)
Tesoro	Areas of higher abundance in non- developed and future development areas	1, 10, 12, 13	Non – site specific measures including construction timing, limiting access and clearing addresses general area	Modifying or curtailing construction and maintenance during sensitive periods, and limiting access and the clearing of right-of-way will reduce impacts on lynx and wolf.  Results – Partially effective
Enstar	Areas of higher abundance in non- developed areas	1, 10, 12, 13	Non – site specific measures including construction timing, limiting access and clearing addresses general area	Same as Tesoro Route, however any impacts on Lynx or Wolf within the KNWR would be at a national level due to conflicts with the USFWS mandate to protect wildlife and their habitats on the KNWR.  Results – Partially effective
Black Bears: E	Black Bear Habitat Map, Figur	re MV-13 (Volume II		
Tesoro	Black bear habitat, and presence of Devil's Club in non-developed areas	1, 10, 12, 13	Non – site specific measures including construction timing, limiting access and clearing addresses general area	Modifying or curtailing construction and maintenance during sensitive periods and limiting access and clearing will reduce impacts on Black Bear.  Results – Highly effective

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		Applicable		
	Resource Topic on	Selective		
	Referenced Map and	Mitigation	Key Site-Specific Features or	
Alternative	Map Legend Features	Measures	General Areas and Mitigation	Mitigation Effectiveness
Black Bears (co	ntinued): Black Bear Habitat	Map, Figure MV-13	(Volume II of the DEIS)	
Enstar	Black bear habitat, and presence of Devil's Club	1, 10, 12, 13	Non – site specific measures including construction timing, limiting access and clearing address general area	Same as Tesoro Route, however any impacts on Black Bear within the KNWR would be at a national level due to conflicts with the USFWS mandate to protect wildlife and their habitats on the KNWR.  Results – Partially effective, concern for increased access resulting from construction
<b>Brown Bears:</b>	Brown Bear Habitat Map, Fig	f		
Tesoro	Brown bear and riparian habitat including important summer feeding areas	1, 6, 10, 12, 13, 14	Span riparian areas by placing towers 200 feet from stream crossings and avoid construction along streams during peak salmon runs, limited access and clearing, and winter construction timing	Modifying or curtailing construction and maintenance during sensitive periods, spanning streams, and limiting access and clearing, along with proper storage of waste and bear training (standard mitigation measure 17) will reduce impacts on Brown Bear.  Results – Highly effective
Enstar	Brown bear and riparian habitat including important summer feeding areas	1, 6, 10, 12, 13, 14	Span riparian areas by placing towers 200 feet from stream crossings and avoid construction along streams during peak salmon runs, limited access and clearing, and winter construction timing	Same as Tesoro Route, however any impacts on Brown Bear within the KNWR would be at a national level due to conflicts with the USFWS mandate to protect wildlife and their habitats on the KNWR.  Results – Partially effective, concern for increased access resulting from construction
Moose: Winter	Moose Distribution Map, Fig	ure MV-15 (Volume I	I of the DEIS)	
Tesoro	Areas of higher abundance in non developed areas	13	Selective vegetation clearing proposed in general	Selective removal of vegetation within the right-of-way might improve winter range if preferred browse species vegetate the cleared areas.  Results – Highly effective
Enstar	Areas of higher abundance in non developed areas	13	Selective vegetation clearing proposed in general	Selective removal of vegetation within the right-of-way might improve winter range if preferred browse species vegetate the cleared areas however, because of conflicts with the KNWR Fire Management Plan, any impacts on the KNWR would be at a national level.  Results – Low effectiveness

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	Resource Topic on	Applicable Selective		
	Referenced Map and	Mitigation	Key Site-Specific Features or	
Alternative	Map Legend Features	Measures	General Areas and Mitigation	Mitigation Effectiveness
Anadromous I	Fish and Beluga Whales:	Anadromous Fish Stre	ams and Beluga Whale Concentration A	Areas, Figure MV-17 (Volume II of the DEIS)
Tesoro	Anadromous Fish Streams	1, 2, 4, 6, 10, 13, 14, 15, 16	Span riparian areas by placing towers 200 feet from stream crossings, and avoid construction during peak salmon runs (winter construction).	Mitigation measures will reduce impacts on anadromous fish streams by spanning streams, and beluga whales by avoiding peak runs and calving periods.  Results – Highly effective
	Beluga Concentration Areas		NMSF prefers July to August construction season. Spring, May-June is the most sensitive due to salmon runs and calving	
Enstar	Anadromous Fish Streams	1, 2, 4, 6, 10, 13, 14, 15, 16	Span riparian areas by placing towers 200 feet from stream crossings, and avoid construction during peak salmon runs (winter construction).	Mitigation measures will reduce impacts on anadromous fish streams and beluga whales  Results – Highly effective
	Beluga Concentration Area		NMSF prefers July to August construction season. Spring, May-June is the most sensitive due to salmon runs and calving	

Alternative	Resource Topic on Referenced Map and Map Legend Features	Applicable Selective Mitigation Measures	Key Site-Specific Features and Mitigation	Mitigation Effectiveness
	nd Use Maps, Figures MV-19,	20.21 (Volume II of th	5	. 6
Tesoro	Residential, institutional, and airports/airstrips	1, 2, 4, 5, 6, 8, 10, 11, 12, 15, 16	KPB CMP compliance including locating line within planned transportation corridor and North Kenai Road ROW with aerial easement; Compliance with FAA regulations to avoid VORTAC and use of markers and high visibility balls; Underground cable past 2 airports, though Captain Cook SRA, Pt. Possession lands, and Kincaid Park; span highway crossings	Impacts to land use are mitigated through selective measures.  Results – Highly effective
Enstar	Residential, institutional, and airports/airstrips	1, 2, 4, 5, 6, 8, 10, 11, 12, 15, 16	Rebuild 69kV line on Enstar South; Underground cable past Flying Crown airstrip; hazard warning ball at Moose River crossing; locate line within road ROW; revegetation in Oceanview Bluff Park; span highway crossings	Impacts to land use are reduced through selective mitigation measures however; impacts within the KNWR would be at a national level due to conflicts with the KNWR Comprehensive Conservation Plan.  Results - Highly effective within KPB, and Anchorage. Incompatible with KNWR Comprehensive Conservation Plan

Alternative	Resource Topic on Referenced Map and Map Legend Features	Applicable Selective Mitigation Measures	Key Site-Specific Features and Mitigation	Mitigation Effectiveness
Recreation: Re	ecreation Management Areas	Maps, Figure MV-22,	23 and Recreation Use Areas Map	os, Figures MV-24,25,26 (Volume II of the DEIS)
Tesoro	ACWR, Parks, SRA, KNWR, Trails, Recreation Sites	1, 2, 4, 6, 8, 10, 12, 15, 16	Underground cable though Captain Cook SRA, Pt. Possession lands, Kincaid Park; directional drilling under ACWR; seasonal construction (fall) will avoid conflicts associated with tourism along the Kenai Spur Highway and Captain Cook SRA	Impacts to recreation are mitigated through selective measures.  Results – Highly effective
Enstar	ACWR, Parks, SRA, KNWR, Trails, Recreation Sites	1, 2, 4, 6, 8, 10, 12, 15, 16	Replace park facilities and revegetation; directional drilling under ACWR; winter construction will reduce impacts to tourism on the KNWR	Impacts to recreation are reduced through selective mitigation measures however, impacts within the KNWR would be at a national level due to conflicts with the KNWR Comprehensive Conservation Plan.  Results - Highly effective within KPB, and Anchorage. Incompatible with KNWR Comprehensive Conservation Plan

Alternative	Resource Topic on Referenced Map and Map Legend Features	Applicable Selective Mitigation Measures	Key Site-Specific Features and Mitigation	Mitigation Effectiveness
Visual: Landsc	ape Scenery Map, Figure MV-	28, Views from Resid	ences, Recreation Areas, Travelways	Map, Figures MV-29,30,31 (Volume II, DEIS)
Tesoro	Distinctive scenic quality class, park-like visual image type, immediate foreground and foreground views from residences, recreation areas, and travel ways	3, 5, 6, 7, 8, 9, 12, 13, 15, 16, 17	North Kenai Road; Captain Cook SRA; Pt. Possession; Kincaid Park; underground due to the proximity to Captain Cook SRA; directional drilling under ACWR; use of planned transportation corridor to allow for vegetative screening along Grey Cliffs and Moose Point Subdivisions; Reduce vegetation contrast in dense forest areas; underground along Tony Knowles Coastal Trail	Impacts to visual resources are reduced through selective mitigation measures.  Results – Partially effective
Enstar	Distinctive scenic quality class, park-like visual image type, immediate foreground and foreground views from residences, recreation areas, and travel ways	3, 5, 6, 7, 8, 9, 12, 13, 15, 16, 17	Winter construction through KNWR; Lowering tower heights in select areas through KNWR; changing structure types in Chickaloon area; directional drilling through coastal marsh; location of transitional facility in shed; towers placed at maximum feasible distance from crossings at recreation areas, highways and trails	Impacts to visual resources are reduced through selective mitigation measures; however, any impacts within the KNWR would be at a national level  Results –Partially effective

Alternative	Resource Topic on Referenced Map and Map Legend Features	Applicable Selective Mitigation Measures	Key Site-Specific Features and Mitigation	Mitigation Effectiveness
Cultural: Cultu	ral Sensitivity Map, Figure M	V-31 (Volume II, DEI	(S)	
Tesoro	High sensitivity areas	2, 4, 5, 6, 12	To be determined during pre- construction activities and	To be determined during pre-construction activities and surveys  Results - Effective
Enstar	High sensitivity areas	2, 4, 5, 6, 12	To be determined during pre-	To be determined during pre-construction activities
ZJADEWA	Tilgii sensitivity dieds	2, 1, 3, 0, 12	construction activities and surveys	and surveys  Results - Effective